Telephony

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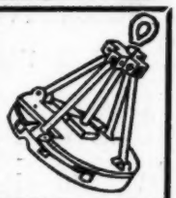

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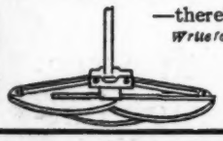

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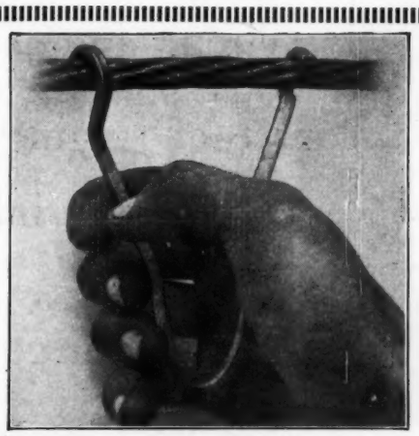

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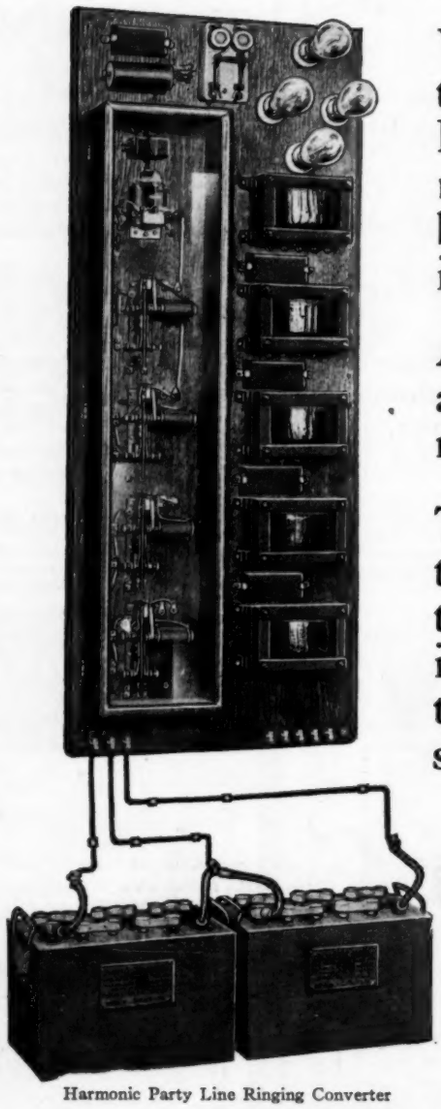

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By the Way—

About the most familiar remark we hear now is: "The price has been raised."

Everything we eat, wear, burn or use in any way—either for necessity or pleasure—has risen in cost.

Are most telephone operating companies getting their fair share of increased income to meet this advanced cost of doing business? Probably not.

The railroad companies have asked the national government for a 15 per cent. increase in freight rates. Telephone companies should plan to ask the state commissions for a raise in rates commensurate with changed conditions. How about it?

Public Utility Bonds.

Public utility securities are steadily gaining favor among experts on safe investments. Secretary of the Treasury McAdoo failed to include them in the list of securities acceptable as collateral securing deposits of government funds received by banks for government bond subscriptions, but that is not surprising.

It takes a long time for Washington officials—particularly financial officials—to adopt any line of procedure different from those long in use. It is interesting to note, however, that the treasury department has been rebuked by investment authorities for thus ignoring the bonds of well-known and prosperous public utility corporations.

In a letter of this kind a Chicago financier writes the secretary of the treasury:

"I wish to make a protest in behalf of high-grade public utility issues, which have not been included as acceptable collateral in the circular issued by your department under date of May 29, 1917, entitled 'Liberty loan; deposits of government funds in connection with the liberty loan.'

National banks, savings banks and trust companies are holders of many millions of public utility issues, and there is no reason why the better class of these issues should not be accepted as security for government deposits in just the same manner as the better class railroad bonds are acceptable.

The records of public utility bonds have proven their merit and it does not seem fair that they should not be accepted as collateral for United States government deposits.

Especially is it unfair when you accept railroad bonds, which are a direct mortgage, providing they are not selling at a market price to yield more than 5½ per cent. It is my humble opinion that any first mortgage railroad bond selling today to net 5½ per cent. would not compare favorably with even the second-grade public utility issues, and further, a first mortgage railroad bond selling at a price to net 5½ per cent. should not qualify the bond to become acceptable security for government deposits."

It is gratifying to note that after receiving a number of protests of this character, and giving the matter more consideration, Secretary McAdoo decided to accept public utility bonds of proved worth. The official notice of this action follows:

"Bonds of electric railway and traction companies, of telephone and telegraph companies and of electric light, gas and power companies, secured by direct mortgage upon their physical property in the United States and listed on some recognized stock exchange, taken at 75 per cent. of their market value, not exceeding par, but not including any such bonds which, on May 29, 1917, were at a market price to yield more than 5½ per cent. per annum if held to maturity, according to standard tables of bond values, will be accepted."

The exclusion of public utility securities by the Treasury Department threatened to act as a damper on the market for this class of bonds, and the reversal of the secretary's position is only a reasonable act of justice. It is unfortunate that it was necessary.

Probably, if he were acting as an individual, Mr. McAdoo would not have drawn any distinction betwen railroad and utility bonds, but, as a government official, he followed the rut of long-established usage. It is a good thing, however, to have public utility securities thus officially recognized, even though the recognition is rather tardy.

Sale of Iowa Properties to Bell

Farmers & Merchants Telephone Co., Owning 32 Plants in Northwestern Iowa and South Dakota, Worth About $1,000,000, Sold to Iowa Telephone Co.—Company's Operations Investigated Last Fall by U. S. Association

Announcement has been made of the sale of the Farmers & Merchants Telephone Co., which owns 32 telephone plants in northwestern Iowa. Control of the property of the company, which had its headquarters at Storm Lake, Iowa, passed to the Iowa Telephone Co., on June 1. The entire property of the company, at the time of the sale, was probably worth in the neighborhood of $1,000,000.

The Farmers & Merchants company commenced operations in January, 1913, at Hawarden, Iowa, with two small exchanges under the management of W. J. Brownell. Since then it acquired other properties along the Illinois Central Railroad. A year ago this last spring it purchased the Martin Telephone Co., of Webster City, from E. H. Martin, for a consideration said to be $250,000.

Exchanges which have passed into control of the Bell company are:

Akron, Alta, Boyden, Blairsburg, Bode, Bradgate, Early, Fonda, Gilmore City, Hawarden, Hull, Hardy, Humboldt, Ireton, Jewell, Livermore, Newell, Ottosen, Pocahontas, Pioneer, Rembrandt, Rock Valley, Renwick, Rutland, Storm Lake, Varina, Westfield, Webster City, and Williams, Iowa; Alcester, Fairview and Hudson, S. D.

Toll lines, mostly iron, connect the various exchanges of the eastern and western groups, which, it is understood, have no toll line connection owned by the company between them.

When the Farmers & Merchants Telephone Co. began buying up so many of the Iowa and South Dakota exchanges, there was suspicion that its operations were financed by the Bell company. Only last fall Vice-President F. B. MacKinnon, of the United States Independent Telephone Association, made an investigation of the company, and reported to the board of directors that, to all appearances, the company was Independent.

The manner in which this company has operated in purchasing so many Independent companies until it had control of the majority of the Independent companies in northwestern Iowa was, as previously stated, open to the suspicion that Bell money was backing it. The sale to the Iowa Telephone Co. indicates that the suspicions were well founded.

It now remains to be seen whether the Department of Justice will take any action in this case, which surely is a violation of the spirit, if not the letter, of Kingsbury commitment. The United States Independent Telephone Association certainly should make a most careful investigation of this sale.

More Ink and Paper Honors for Bell

Title of Article in The Transmitter Commenting on Publication in World's Work of Statement that Theodore N. Vail Induced the Independent Telephone Companies to Join with Him in Supporting the Government

In the June, 1917, issue of World's Work, a nationall-circulated publication of current events, published in New York City, there appeared a full page photograph of President Vail of the American Telephone & Telegraph Co., and under the picture is this caption:

> Mr. Theodore N. Vail.
>
> "Who has not only put the American Telephone & Telegraph Co., of which he is president, at the disposal of the government, but he has also induced the Independent companies to join with him in like action, so that the entire wire service of the United States has been changed to a war basis without any disturbance in personnel or management."

Read that again. "——he has also induced the Independent companies to join with him in like action."

Transmitter means no discredit to Mr. Vail when it undertakes to straighten up the record and correct the false impression this statement is likely to spread. Mr. Vail is a big man in the telephone business, undoubtedly—a big man in the Bell system, certainly—too big a man, we think, to desire the least of unearned credit or unmerited praise. He is too big, we believe, to take undue advantage of the ignorance of even a magazine editor, who, knowing nothing of the real facts of the telephone business and the magnitude of the Independent telephone industry of this country, has, we believe, lent a too-willing ear to the soft speech of somebody's publicity department.

We are of the impression, at this writing, that Mr. Vail is a big enough man to see that the World's Work corrects, in its next issue, its unwarranted statement in its June number, by saying that Mr. Vail did not *induce* the Independent companies of the United States to offer their services to their country in the time of its need.

If World's Work knew anything of the telephone business, it would know that for Mr. Vail to *induce* the Independent telephone companies to join him in this movement would be impossible for two reasons alone, if not for others—and those two are these:

First, that an Independent telephone man does not wait to be "induced" by the Bell telephone system to do those things needful to be done for his country; and, second, that even if he had to be "induced" the last outfit in the world that could ever induce him to do anything would be the Bell system.

Transmitter admits that this is no time to indulge in miscellaneous scrapping over the proper distribution of credit and glory. We have no desire to muddy the water by kicking up a fuss. But we do not think it is right to sit by in a sort of "watchful waiting" and let the Bell hog all the credit for doing good things.

The Independent men of this country are doing their "bit"—doing nobly, too. They are making their own sacrifices, doing their part of this great work. They are giving of their work, their time, their money, to serve their country. So let's keep the record straight, gentlemen. There's enough honor and glory for all—let's divide it fairly, according to justice and right.

The real facts are these:

The Council of National Defense was appointed by the government, as most everyone knows. On this council, Daniel E. Willard was the member in charge of transportation and communications. Mr. Willard divided the work assigned

(*Concluded on page* 29)

British Colonial Telephones

Abstract of Paper Presented Before Institution of Electrical Engineers and Published in The Electrician — Telephone Systems in the Crown Colonies, South Africa, Canada, Australia and New Zealand—First Installment

By R. W. Weightman

Throughout the paper it has been necessary to deal with the great Dominion of Canada separately. There, the methods are based on American practice, as distinguished from British Post Office practice, which is followed more or less throughout the other dominions and colonies. It will therefore be understood that where the "dominion and colonies" are referred to, Canada is not included unless otherwise expressly stated.

British Post Office Practice.

With the gradual standardization of materials and plant generally in the home department, and the publication by the department of books of technical instructions, the dominions and colonies have got more or less into the way of accepting post office practice as beyond question. There is the feeling that, no matter what the subject may be, the practice laid down for it has been well thought out, and is the result probably of years of experience and of capable and careful research.

Colonial methods vary in many matters of detail from those in vogue at home. The administrations of the dominions send their chief technical officers to see what is being done elsewhere, and to cull from the various systems those features which are the most advantageous for adoption in their own countries. But as the bedrock of it all, British post office practice is outstanding.

Appointment of Engineers.

In the earlier days many of the engineers, and many officers of other ranks as well, appointed in the dominions and colonies, were men who had received their training in the various home services. This still applies to appointments in the Crown colonies, but it is only rarely the case now in the dominions.

In a general way, any youth starting at a government primary school can, with the aid of government bursaries, pursue his studies through the government high schools until he finally reaches the university college, where he can qualify in a degree of practically equivalent value to the B. Sc. of England. The colonial youth certainly has few opportunities of acquiring a practical training, but this is not so necessary as in the case of students in the heavier branches of engineering. So we find the youths of the dominions qualifying in their respective engineering departments for even the highest positions in them.

There are, however, several colonies in the tropics in which the conditions are so trying that Europeans must have the relief of a change to a temperate climate at frequent intervals. The colonial office leave regulations wisely make generous provision in this respect as regards some of these colonies, but other colonies with equally trying climatic conditions are not so well off.

For the filling of engineering appointments in these colonies, the colonial office will always look for men at home, and provided that they offer sufficiently remunerative salaries, they need not fear any dearth of applications from men of the right sort for these appointments. But there is a tendency to parsimony in this respect in many of the colonies. In the interests of colonial engineering, and in the higher interests of colonial administration, only the best men should be selected for these posts, and such men will not come forward unless the salaries offered are sufficiently tempting. Low salaries for men in positions of responsibility is false economy.

In another direction the governments of the Crown colonies are very short-sighted. They do not encourage their engineers sufficiently to keep themselves up to date. A technical officer should be commissioned by his government to visit England frequently to enable him to keep in touch with the latest developments.

Working Staffs.

With well-trained staffs of European character, the engineers of Canada, Australia and New Zealand are relieved of much of the worry which falls to the lot of engineers in those countries where the bulk of the labor is black. In Australia there is an arbitration court, established by act of parliament, for the investigation and settlement of labor disputes. Any difficulties of this nature that arise are referred to it, and the award of the court is loyally accepted and acted upon by both sides. In New Zealand there is a board of appeal on somewhat similar lines.

In Canada there is a law of doubtful value, under which employes can apply for a board of conciliation to discuss differences between themselves and their employers.

In South Africa and in most of the Crown colonies, the rough labor is performed almost entirely by men of the native races, while generally the positions of control are held by Europeans. In Ceylon the main supply of labor is drawn from the south of India. All positions higher than that of overseer are held by Europeans.

The provision of rough and semi-skilled labor in British East Africa, Uganda, Nigeria, the Malay States and South Africa, is dealt with next. It is pointed out that engineers in all the black colonies are hampered by the disinclination of the natives to work and by the utter lack of sense of responsibility on the part of the natives.

Supply Sources and Delivery Delays.

Of all the dominions and colonies, Canada is the only one that has made any headway in the manufacture of apparatus and material for telegraph and telephone purposes.

In Australia, cast-iron pipes, stoneware conduits, copper tapes and certain fittings are manufactured in the country. Prior to 1913 practically all the insulators used came from Germany, but insulators of both porcelain and stoneware are now being made within the commonwealth.

A fair amount of magneto telephone apparatus and switchboard material is obtained from Sweden, while some of the larger exchange switchboard plant and automatic apparatus come from America. Wire, cable, telegraph apparatus generally, and material of a kindred nature are obtained almost exclusively from Great Britain.

It is the rule to invite tenders for all supplies and to give preference to goods of British manufacture. The other dominions and colonies import practically all their plant. This is largely obtained from England, but quantities of apparatus have been supplied from both the continent and the United States.

The great distances these countries are situated from their sources of supply, and the delays in delivery that have taken place, have been serious drawbacks to the smooth working of most of the colonial engineering department.

The author would like to impress upon manufacturers of telegraph and telephone plant the great need there is for the more important execution of orders from the colonies. Before the war it was no uncommon thing to hear an engineer say he would not put up with the dilatoriness of British manufacturers, and that he would send his orders to the con-

tinent, and in some instances orders were actually sent there.

In the dominions and in some colonies these difficulties are got over by the establishing of "reserve stores," in which ample supplies are kept to meet all ordinary demands. This is a plan which every colony with any considerable system should adopt in order to minimize delays.

Administration.

The methods of administration throughout the colonies are naturally varied to meet the local conditions, but in all the dominions (with the exception of Canada) and also in all the larger Crown colonies, the telegraphs and telephones are combined with the postal service of the country, and the postmaster-general is the officer responsible to the government for the proper management of the organization as a whole.

In some of the smaller colonies, telephone exchanges have been established by private companies; but they are generally on so small a scale that their control falls to the colonial public works engineer. For anything of a technical nature in which he is not quite sure of his ground, he obtains advice from consulting engineers in England.

In the larger Crown colonies we usually find an organization on the lines of the home post office. It has been argued that the engineer should be directly responsible to the colonial secretary, but this arrangement would not be likely to work well in practice. It is most desirable that the relations between the head of the department and the engineer should be of an amicable nature. The efforts of the most capable engineering body in the world may be thwarted and the engineers themselves discouraged if there is undue interference and a lack of sympathy and support from the postmaster-general and his staff.

Dominion Telephone Administration.

Telephone administration is a more complex question. The telegraph administration in America, more than anywhere else, has been studied and developed into a fine art, particularly by the American Telephone & Telegraph Co., whose operations extend over the whole of the United States.

This company introduced a new system called the "functional system," in which the organization is divided into three sections — traffic, engineering and commercial — and on the headquarters staff a specially-qualified officer is placed in charge of each section. In each division the work is similarly divided. There is an officer in charge of each section of the work, and each is directly responsible to the headquarters chief of his section.

The duties and responsibilities of the officers of each section are carefully defined, but they are so correlated that a certain amount of overlapping is unavoidable. This feature of the system is claimed to be one of its chief advantages, inasmuch as it necessitates the full verbal discussion of a subject in all its bearings before it is reported upon, and much time and correspondence are thus saved.

Canada.

The telegraph and telephone services of Canada are quite separate from each other, as in the United States. By far the larger portion of the telegraph system is in the hands of the North-Western Telegraph Co., and the telegraph departments of the Canadian Pacific and the Grand Trunk Railway companies. The operations of the companies are subject to the dominion railway act. There is no active competition between the different administrations.

The form of administration adopted by the companies is comparable with that of the railway companies of Great Britain. The government department is controlled by a general superintendent under the office of the minister of public works.

The telephone services of Canada are partly in the hands of the provincial governments and partly under private and rural companies. There is no real competition between the large administrations, The rural companies, are, however, frequently started in competition with the ruling company, and intercommunication difficulties arise. Where a question of interconnection between any company's system and the long distance lines of another company arises, the board of commissioners have the power to direct what shall be done, and they determine the terms as to compensation on the merits of the case.

The construction of rural lines by Independent local companies for the purpose of giving telephone service to farmers is much encouraged by the various provincial governments. In this respect, Canada is a shining example to the other dominions and colonies.

The regulations of the Saskatchewan Provincial Government under which these companies are formed are typical. The companies are not allowed to operate their systems within towns or villages. The lines are built to a standard laid down in very complete specifications and instructions prepared by the government department of telephones. Poles for the construction of the lines can be obtained from the government at cost price. The specifications are accompanied by drawings, and they, also, are so comprehensive that but little difficulty is experienced by the farmers in constructing their own lines themselves.

Australia.

The telegraphs and telephones are a close monopoly under the post office in Australia.

Under the department's regulations it is provided that lines for public use in country districts, which may not be immediately remunerative to the department, may be erected under a system of guarantee, under which the department bears 50 per cent. of the estimated annual loss.

In other cases the local residents are permitted to erect the lines themselves, to the department's specifications and at the department's expense, provided that the work is carried out at such a cost as will bring it within the guarantee regulations. It is found that the local people can carry out the work at a cheaper rate than the government department, owing to their being in better touch with the local labor supply, and with the transport and other local facilities.

The fullest encouragement is given to persons living in the country to erect their own lines, either individually, or conjointly with their neighbors, for connection with post offices or exchanges. The department furnishes applicants with all the information they may require, both as to the best means of establishing connections and as to the class of construction best suited to their requirements. The system of administration is one which has been built up with the development of the services, and it may be said to follow "territorial" lines.

The department has a complete monopoly of the telegraphs and telephones of the country, and it does not encourage the formation of private companies for the establishment of rural or other lines. Under the telegraph act no person or persons may construct telegraph or telephone lines for hire or profit, but there is no hindrance to persons erecting lines for their own use. Many such lines have been put up by farmers in the back blocks of the country where the government does not feel warranted in spending money on lines which offer little prospect of paying their way. Such lines usually terminate in a government office or exchange where they are given connection with the government system.

South Africa.

In South Africa the telegraphs and telephones are also under the postmaster-general. Of all the dominions outside Canada, South Africa is the first to adopt the "functional" system. With the advent of the Union, the separate administrations were merged in the one central administration, and a system closely allied to the "territorial" was applied to the whole of the Union. With the great development of the telephone system, this method of administration was found to be unsuitable, and the "functional" system was introduced about three years ago.

There is practically no overhouse construction in any of the dominions or col-

onies, and the chief difference in the construction of pole lines lies in the character of the pole employed. Where timber is plentiful and there are no local drawbacks to its use, wood poles are the rule. But where it is scarce or not of suitable size or quality, or where it is liable to be attacked by white ants or destroyed by grass or bush fires, iron poles are used.

White ants abound in practically all the tropical colonies, and while it is usual in such countries to find an indigenous wood which is more or less immune from their attacks, it is not always suitable for use as telegraph poles.

South Africa is not what may be termed a timber country, although there are forests of indigenous trees here and there. Among these the "sneeze-wood" is the only one that will withstand the ravages of the white ant for any length of time, but even this wood is not free from attack. The core of the "sneeze-wood" is almost as hard as iron while yet as flexible as whalebone, and the author has heard of only rare cases in which the ant has been able to eat into it.

These "sneeze-wood" poles served their purpose well in the construction of the lines that were built in the early days. The poles were not suitable either in height or strength to carry more than a few wires, and with the gradual opening up of the country they were replaced with tubular iron taper poles imported from England.

In British East Africa and Uganda there is a "live" pole in use which is perhaps unique in its way. Some years ago a temporary line was erected with poles which when planted unexpectedly took root and became trees. These poles were found to stand much better than ordinary "dead" wood poles. Benefiting by this experience, the administration built about 1,000 miles of line with this type of pole. They were cheap and they have served their purpose well in the development of the country during a period when funds were limited. They have their disadvantages, however. With improved financial conditions these colonies are now using tubular iron poles.

Pole Lines.

There are two types of tubular iron poles with cast-iron bases and wrought-iron taper upper tubes in general use in the Crown colonies. In all these poles, the cast-iron base is of sufficient length to keep the wrought iron tube out of the ground when the pole is planted to its proper depth.

One type of pole has its base pointed, the point being solid for about 5 ins., so that it can be driven into the ground by means of a special rammer, which is dropped inside the base.

The standard type of pole used has a cylindrical cast-iron (parallel) base with square flange at the bottom end to which a buckled base plate is bolted. Poles of this type are made in a number of standard lengths and strengths. Where the length is 40 ft. or over, the upper part is made in two or more sections. A factor of safety of two, based on a wind pressure of 17 lbs. per square foot, is sufficient for these poles in countries where there are no snow and ice accumulations to be taken into account. Where snow and ice occur a factor of safety of four should be allowed.

Fig. 1 shows a light pole specially designed for South Africa. It is used on farmers' lines and carries one or two pairs of wires between main routes and the homesteads. It will carry wires having a total lateral stress of about 80 lbs. 12 ins. from the top. It is probably the lightest and cheapest pole used in telephone practice anywhere.

There is a parallel pole of a more ornamental type, which is used for special

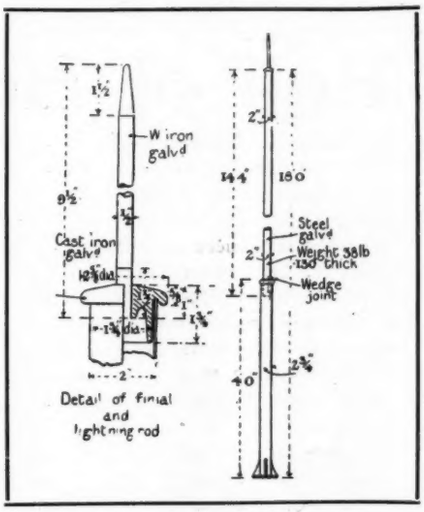


Fig. 1. Wrought-Iron Pole.

street work in South Africa. There is no cast-iron base with it, but it is protected from corrosion at the ground line by means of a sleeve which is shrunk on. It is 26 ft. in length and will bear a maximum load of about 300 lbs. at the top when planted 4 ft. in the ground. Where poles of similar type have been planted without the sleeve protection, corrosion has often taken place at and above the ground line.

In some of the Crown colonies, tubular poles of the type introduced by the Indian government and known as the Hamilton pole are used. A full length pole is about 58 ft. out of the ground, and it comprises eight sections each 8 ft. long. The poles taper from about 12 ins. at the bottom to 3 ins. at the top.

The number of poles to the mile varies with the class of line. Twenty to the mile may be said to be the lowest number that is allowed on a light country line, but the author knows lines on which the average per mile is much below this figure. From this the number ranges up to 40 to the mile. The author has had experience of spans up to 800 yds. standing quite satisfactorily for many years.

The poles are especially stayed, double-width spacing is given on the arms, only one quality and gauge of wire is erected, every care being taken to adjust all the wires to the same dip, and no joints are made in the spans. With these precautions the wires all swing in unison, and there is no trouble.

The stays used throughout these countries are of British standard types, with tighteners and with iron anchor plates which are usually tarred. In South Africa, a Crosby clip is now used for clamping the stay wires at the pole and also at the tightener.

Iron Poles.

Where iron poles are employed near the sea, they can only be preserved from corrosion by being frequently painted or tarred. The author has tried every kind of paint for this purpose, but he found none to stand any better than coal tar applied in the heated state. Reinforced concrete poles would be more serviceable than iron in these situations, but the weights of these poles in proportion to their strengths are against them for lines where the difficulty of transport is a serious factor.

Hollow reinforced concrete bases made in molds locally and fitted with wood tops are sometimes used. Discarded railway rails are also used, the rails being set with the web of the rail at right angles to the direction of the line.

In Canada, wood poles and arms are used. There are no iron or reinforced concrete poles in use.

Each railway company's telegraph lines are erected on the right of way of the railway concerned. The lines of the Great North-Western Co. follow the highways except in cases where the company have contract privileges for the construction of lines along the railways, but it may be said of Canada as a whole that there are few highway telegraph lines in the country.

The main telephone lines follow the public roads. Short cuts across country, except in the case of rural companies' lines, are resorted to only in special cases and where the right of way can be obtained.

These wood poles are generally of cedar. The standard lengths of poles used vary considerably. The standard length pole of the Canadian Pacific company is 25 ft., but in broken country the poles vary up to 45 ft. in length. The Grand Trunk company's standard lengths are 25 ft. to 30 ft., set 5 ft. in the ground, 35 ft. to 50 ft. set 6 ft., and 45 ft. to 50 ft. set 7 ft.

The standard of the Bell telephone

company is 35 ft. With other administrations, 30 ft. to 35 ft. is usual for exchange construction and long distance lines, while on their rural lines 20 ft. and 25 ft. lengths are commonly employed.

The spacing of the poles is varied in the different administrations, and it varies with the class of line. One system, which is typical, allows 40 poles to the mile on heavy routes, 36 to the mile on less heavy, 32 to the mile on lighter, and 30 to the mile on light routes.

Both wood and iron poles are used in Australia, the selection depending generally upon whether or not dangers from white ants or bush fires have to be met.

All the wood poles used are obtained from trees indigenous to the country. Up to the present no treatment for the prevention of decay has been applied, but the question of introducing creosoting plant for this purpose at the larger centers is under consideration. In districts infested with white ants, all poles are protected from their attacks by the application of a solution of arsenic (1 lb.) and caustic soda (2 lbs.) dissolved in 1 gallon of water.

Poles vary from 20 ft. to 75 ft. in length and from 5 ins. diameter at the small end and 8 ins. at the butt, to 12 ins. at the small end and 20 ins. at the butt. The minimum height from the ground of the lowest wires along the road is 12 ft. and at the road crossings 18 ft.

All wood poles are provided with lightning conductors of No. 8 galvanized iron wire. Where poles are stayed, anchor logs not less than 9 ins. diameter and 4 ft. in length with 4 in. square washers are used.

New Zealand has a greater variety of types of poles than most countries. Poles of wood, tubular iron, reinforced concrete, and discarded railway rails are in use. The wood poles are mainly from indigenous trees, but timber generally is scarce. A good many poles of ironbark wood have been obtained from Australia. There are no white ants in New Zealand and poles are but rarely damaged by fires. The standard lengths of wood poles in use are 18 ft., 20 ft., 25 ft., 30 ft., 40 ft., and 45 ft., and the poles are not earthwired.

The reinforced concrete pole used is of solid construction, the cross section being rectangular. The dimensions and strengths of two typical 25 ft. poles are:

1. 7 ins. by 4 ins, at the butt, tapering to 3½ ins, by 3 ins. at the top. Weight 490 lbs. Working load 150 lbs.

2. 7 ins. by 5½ ins. at the butt, tapering to 5 ins. by 3½ ins. at the top. Weight 720 lbs. Working load 250 lbs.

Hollow concrete poles are not employed.

Poles of 52-lb. and 70-lb. discarded railway rails are largely used, and are said to make splendid lines. Poles of this type have been used for a great many years, and are so favored that they would be in general use but for the fact that they are not available in the quantities required.

(To be continued.)

The Roll of Honor

On June 14, Major L. D. Wildman, chief signal officer of the U. S. Signal Corps of the central war department at Chicago, received the following telegram from Major General Squier, chief signal officer of the army, regarding further applications for commissions in the signal officers' reserve corps:

"Signal corps proper, section officers' reserve corps, closed to further original applications effective today. It is desired and expected to meet future needs for officers in this section largely by production from the ranks of all signal troops. Give the above the widest publicity."

The following officers were selected and recommended to the chief signal officer at Washington by the central war department before the order quoted became effective:

For captains: David G. Williams, Columbus, Ohio; and C. R. Welch, Kansas City, Mo.

For lieutenants: J. F. Hudson, St. Louis, Mo.; and J. M. Schoonover, Terre Haute, Ind.

Of those volunteering in the southwestern group, comprising Missouri, Kansas and Colorado, of which A. F. Adams, Kansas City, Mo., is chairman, the following men have been examined, accepted and sworn in:

Ernest Appell, Kansas City, Mo.
John H. Aydelott, St. Louis, Mo.
Scott Bailey, Lawrence, Kan.
Emery D. Bearden, Kansas City, Mo.
Geo. L. Botts, Independence, Mo.
Clyde H. Burnette, Macon, Mo.
Fred Bowenschult, St. Louis, Mo.
Wilbur C. Brown, Ozowkie, Kan.
John L. Burnham, Joplin, Mo.
Mark D. Bussey, Joplin, Mo.
Roy E. Chase, St. Louis, Mo.
Bliss F. Clark, Maryville, Mo.
Ernest W. Cleverdon, St. Louis, Mo.
Thomas G. Crawford, Purdy, Mo
Clyde D. Crosswhite, Parker, Kan.
Tom R. Culver, Maryville, Mo.
Burt B. Curts, Kansas City, Mo.
J. O. Dearing, Joplin, Mo.
Herman M. DeFrise, Marshfield, Mo.
Willard Droke, Joplin, Mo.
Homer C. Dragoo, Maryville, Mo.
John W. Dunlap, Clay Center, Kan.
Clarke J. Dunlop, Kansas City, Mo.
Harry E. Early, Parker, Kan.
Roy D. Edwards, St. Louis, Mo.
Wm. N. Farley, Sarcoxie, Mo.
Wallace G. Fieldson, St. Louis, Mo.
William H. Follen, LaMonte, Mo.
Archie L. Gates, St. Louis, Mo.
Paul E. Gentry, Webb City, Mo.
Bryan Gilmore, Carl Junction, Mo.
Hugh J. Gilmore, Joplin, Mo.
Robt. Henry Gragg, Sedalia, Mo.
Roy T. Green, Lawrence, Kan.
Raymond E. Hardy, California, Mo.
Russell O. Hare, Parker, Kan.
Frank B. Ingram, Kansas City, Mo.
Philip B. Janssen, Lamonte, Mo.
William M. Janssen, Lamonte, Mo.
Walter Keeney, Sedalia, Mo.
John J. Kinealy, St. Louis, Mo.
Floyd King, Ozowkie, Kan.
Harry F. Kirkendall, St. Louis, Mo.
John E. Kissinger, Sedalia, Mo.
Walter F. Lamping, St. Louis, Mo.
Leland Leonard, Baldwin, Kan.
Theo. H. Lembeck, St. Louis, Mo.
Wm. E. Lyon, St. Louis, Mo.
Frank Madison, Kansas City, Mo.
Clarence R. Malone, Sedalia, Mo.
Grover C. Massie, Hunnewell, Mo.
Jul. G. H. Math, St. Louis, Mo.
Mathew R. Mayse, Plattsburg, Mo.
Eugene R. Miller, Frankfort, Mo.
Floyd Miller, Ottawa, Kan.
Harold Miller, Emporia, Kan.
Robert C. Mitchell, Kansas City, Mo.
Gilbert L. Newkirk, St. Louis, Mo.
Hugh S. Newton, Pattonsburg, Mo.
Cyril E. Nolin, Parker, Kan.
Raymond B. Perriquay, Sedalia, Mo.
Fred. T. Petty, St. Louis, Mo.
William A. Powell, Richmond, Mo.
George E. Rector, Sedalia, Mo.
Geo. A. Roeder, St. Louis, Mo.
Theodore H. Riner, California, Mo.
Lovell L. Roe, Sedalia, Mo.
Victor H. Schulte, Jefferson City, Mo.
A. W. Schwerdtfeger, Jefferson City, Mo.
Clark Silvey, Jefferson City, Mo.
Louis E. Shull, Sedalia, Mo.
Aubrey E. Slavens, St. Louis, Mo.
Jos. A. Smith, Sedalia, Mo.
Jos. J. Smith, St. Louis, Mo.
Martin P. Stokes, Jefferson City, Mo.
R. B. Smith, Sedalia, Mo.
Claude E. Stephens, Joplin, Mo.
Orin W. Stapleton, Altoona, Kan.
Karl W. Trisler, St. Louis, Mo.
Homer Warren, Joplin, Mo.
Ray M. Wells, Sedalia, Mo.
Roy R. Williams, Sedalia, Mo.
Herbert C. Winslow, Marshfield, Mo.
Eugene Welch, Carl Junction, Mo.

Practical Kinks in Soldering

Soldering Ideas and Experiences of Telephone Troublemen and Repairmen —Good Soldered Connections Prevent Future Trouble in the Exchange, on the Line, and at the Subscriber's Station — How Soldering Is Done

In telephone work there is a great deal of soldering to be done both in the plant and outside. Soldering is an art—but a joint once well-soldered is never a source of trouble. Many times soldering is

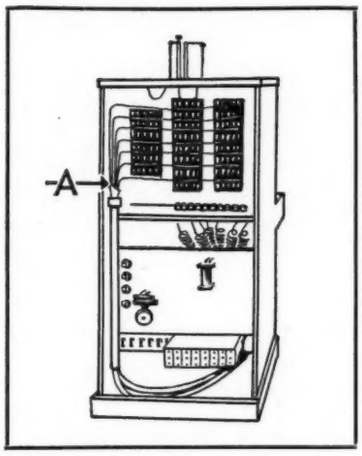


Fig. 1. Poor Flux Causes Cross Talk.

attempted but is not well done. Later trouble develops and its source is finally traced to the soldered parts.

Many telephone men, through practical experience, have developed "kinks" which are of value whenever soldering is to be done. The M. W. Dunton Co., of Providence, R. I., has collected a number of soldering kinks and has turned over a number of them, which relate especially to telephone work, to TELEPHONY.

In a case where a poor soldering flux caused cross talk, the one who sent in the kink wrote:

"At one time I was ordered to trace cross talk on a board and found a case that kept me guessing for some time, as everything appeared to be all right. The cable to the cross-connecting rack was annunciator wire. On looking it over I found that someone had spilled muriatic acid over it while soldering the connections at *A* (Fig. 1). No less than three cables were soaked in this way. Of course the part had to be rewired, and you can bet Nokorode was used on the rewiring."

In repairing work around a switchboard, a recipe is given for soldering new platinum points in contact screws. The instructions for doing this are as follows:

"Hold hot soldering copper on old point, *A*, (Fig. 2) until it becomes loosened and falls out. Then, after fitting a piece of platinum the proper size, using Nokorode, tin this end to be inserted in contact screw *C*; also fill end of screw at *B* with solder.

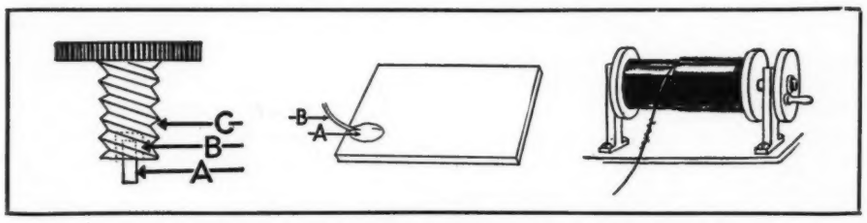
Then place the platinum point on the screw and heat the soldering iron until the point is in its proper place.

Dress end of this point until it fits the other contact and you have a perfect job. (It may be necessary first to drill out the old point.)"

In discussing the soldering of fine wire to large parts, another practical man who evidently has been through the mill and has learned the soldering art, writes:

"There is one principle in soldering that must be invariably followed to insure a first class job: Both of the parts to be soldered must be hot enough so that the solder will melt and adhere to them.

The drawing (Fig. 3) shows a tin strap which will require considerable more heat than the fine wire *B*. The strap is heated first and some solder is allowed to accumulate on it as at *A*.



Figs. 2, 3 and 4. Soldering Kinks for the Shop Repairman.

As the melted solder will heat the small wire almost instantly, the soldering iron is removed and the wire put into the heated solder before it has time to cool.

Fine wire, or wire known as tinsel, is difficult to solder in any other way because it burns so quickly."

Quite often in exchange repair work it is necessary to unite small wires and solder is essential to a good connection.

"In rewinding coils with small wire," says another contributor to "Soldering Kinks," "one often breaks the wire or comes to a splice and usually has to go to the trouble of lighting his torch and heating his iron.

"I use the following method to obviate this trouble and find it much quicker: I keep on hand a quantity of small strips of tinfoil about 1 in. by ¼ in., also small strips of tissue paper.

When I make a splice, I apply a little Nokorode and wrap the joint with one of the small strips of tinfoil. I then hold the joint over a lighted match or candle for a few seconds—just long enough to melt the foil and let the surplus run off. Then I wrap with tissue paper and go ahead winding.

This operation, which is shown in Fig. 4, can be completed in a minute. It is very convenient and a time saver."

Every once in a while a repairman is called upon to make an emergency repair. A repair made on a telephone generator is described by one telephone man as follows:

"When a small wheel (or cog) on a telephone generator is worn out and you haven't one of the right kind to replace it, you are sometimes up against it.

We have repaired them by taking a wheel of the same size, Fig. 5, but sometimes with a hole, C, in it very much larger than the spindle *A*.

Place a tight washer on the spindle and tin the spindle and the hole in the wheel; place the wheel on the spindle and fill the space with solder at *B*.

To get the spindle in the center of the wheel, take the magnets off the generator and place the generator on end in a vise with the wheel on top, and turn the large wheel slowly while the solder is hot and the small wheel becomes true and runs as smooth as a new one."

On the line, soldered joints are sometimes quite necessary. A case of this kind is that where a splice is made on copper-clad iron wire as related in the following kink:

When a splice is made on copper-clad iron wire, it is impossible to keep from cutting through copper as at *A*, Fig. 6. When left in this condition, moisture soon starts a chemical action which causes rust and results in a bad splice.

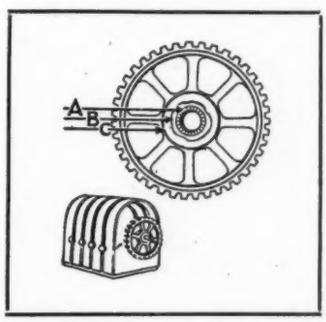


Fig. 5. Fastening Wheel to Generator.

The best way to avoid this is to carefully solder the splice and tin all of the place where the copper coating has been punctured.

This is easily accomplished by the use of Nokorode, as solder will go any place

Fig. 6. Soldering Copper-Clad Wire.

Nokorode does and easily flows over the injured parts.

Occasionally a troubleman will run across an unusual fault as related in a soldering kink entitled, "Solderless Connectors Should be Soldered on Telephone and Telegraph Work."

"After a long hunt on a telephone circuit," the contributor of this kink states, "trouble was found about seven miles

Fig. 7. Split Connector Causes Trouble.

down the line in the middle of a span, put there no doubt when the line was strung.

"One side was split from end to end. The split was caused by too many turns of the sleeve.

Still it had held for years without making trouble, but it made enough trouble in six months to cut years off the lives of all concerned. The wire was worn

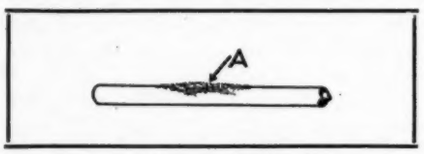


Fig 8. Splicing Rusty Wire.

and corroded and by turning very slightly it would go 'wide open.'"

Making a splice in a rusty telephone wire is quite an art. How one man does it is told in the following kink:

"When I solder a joint on an iron telephone wire or jumper, especially if the wire has become rusty as at *A* (Fig. 8), I take a small or medium size flat file to clean the wire with and put on a little Nokorode, use a blow torch, or soldering copper, and I get a first class joint.

A line wire flies easily when there is tension on it."

Soldering steel wire to iron rods is difficult, as anyone who has attempted it can testify. "I once had a job of soldering a piece of No. 14 iron wire on about 50 ground rods," says another contributor to "Soldering Kinks." "Instead of using a blow torch or other ordinary means of soldering, I carried the ground rods to a blacksmith and asked the smith for permission to use his vise, file and forge for awhile.

"I first filed all of the rods clean and wrapped the iron wire with several turns around the rods and snubbed the wire in the ordinary way (Fig. 9).

When ready to solder, I heated each rod and wire at the point where the wire fastened to the rod until it was hot enough to melt solder. Care was taken not to heat the wire too much.

I applied a little Nokorode to the heated wire and rod and used ordinary half and half solder, turning it over and over, and a neat job of soldering was quickly done.

This is a quick way to do soldering of this kind even if you have only one or two jobs to do, but it saves a great deal of time if you have quite a number."

Along the same line is that of soldering a ground wire to a lead pipe, especially if cold water is running through it. One man gives his experience in doing this as follows:

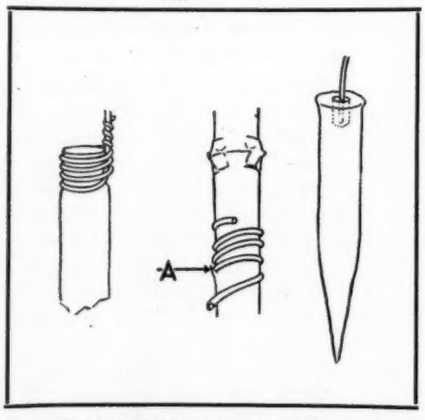
"One thing that I have learned, is how to solder a ground wire to a lead water pipe in a vertical position with cold water running through it—acid is no good for this.

One of the best things to use in soldering is Nokorode. First cut a small gash in the pipe as shown at *A* in Fig. 10. Then wind wire around pipe in this gash using a little flux and apply solder and iron together.

Don't have the iron too hot or the solder will spatter, as the pipe is cold."

A kink used in soldering a ground connection where copper wire is to be united with the ground rod is described as follows:

Drill a small hole in the top of the rod about ¾ in. deep (Fig. 11) and put in



Figs. 9, 10 and 11. Soldering Ground Wire.

a small quantity of Nokorode. Apply the flame of the blow torch until hot and then melt full of solder. Put a little flux on the copper wire and insert it in the molten solder and hold it there until the solder sets.

This is better than wrapping the wire around the rod and then soldering, as the flame does not come in contact with the surface to be soldered and does not oxidize it. The solder does not run and it saves scraping the rod.

"Solder Telephone Joints Wherever Possible" is the title of a soldering kink

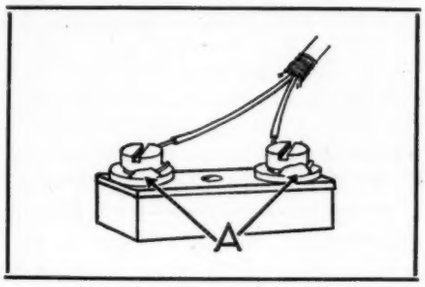


Fig. 12. Soldered Block Connection.

for connecting interior duplex and drop wire. The writer of the kink says:

"Soldered joints can't be beat and it is often necessary to solder interior duplex and drop wires to make some other connection.

A very simple and quick way is to

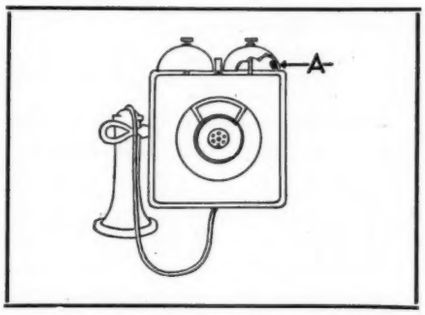


Fig. 13. Changing Tone of Bell.

solder each contact as at *A* (Fig. 12). It is best to apply the heat from the middle of the flame so as not to smoke up the joint and prevent the solder from sticking."

Quite often a telephone company receives a request to change the tone or to muffle the gongs of ringers. Along this line one of the contributors to "Soldering Kinks" writes:

"When there are several bells in the house or office which sound alike, the tone may be changed by sticking more or less solder, according to the tone desired, to the under side of gong as at *A* (Fig. 13). The closer to the edge the more effective.

First scrape bright and apply some Nokorode, and with a hot iron melt some solder on the gong. If too low a tone, cut or melt some away until toned to suit. If desired to muffle some more, a larger quantity is soldered on until the correct degree of muffling is obtained."

To Erect New Exchange.

Contracts were let recently by the Moore & Liberty Telephone Co. for the erection of an $8,000 exchange building at Enderlin, N. D.

Fundamental Principles of the Telephone Business

A Reading Course Designed to Present Logically the Principles Which Underlie Successful Organization and Operation of Telephone Properties—Prepared Under the General Supervision of Stanley R. Edwards—This Section, "Part VI, The Valuation of Telephone Properties," Written by Chas. W. McKay

Quiz Questions on the Preceding Installment.

184. Describe a method of measuring the lateral conduit.

185. How is the length of the lateral cable determined?

186. What notation should be made by the inspector when inventorying the underground terminal equipment? What distinction is made relative to a terminal as regards underground and aerial cable?

187. What checks may be used to determine the size and gauge of underground cable?

188. Why is it out of the question to measure all of the block and house cable? What is probably the most satisfactory way to effect their inventory?

189. State the costs which are included in submarine cable exchange and toll accounts Nos. 246 and 256. How may the length of submarine cables be ascertained?

CHAPTER X. Inventory of Miscellaneous Equipment.

190. *Items of Miscellaneous Equipment.*—The consideration of the inventory of the land, buildings, subscribers' station equipment, central office equipment and the outside plant has been completed. There still remains, however, a group of items—usually of comparatively small monetary value—which nevertheless are most important to the successful operation of any telephone property. These miscellaneous items include "General Equipment, Account 260," "Material and Supplies, Account 122," and "Right of Way, Account 207."

191. *General Equipment, Account 260.*—"This account should include the cost of the equipment classified in the sub-accounts hereunder. Items of small value or short life, such as portable tools liable to be lost or stolen, temporary shelving, waste baskets, gloves, whips, and the like, should not be included in this account or the sub-accounts hereunder but should be charged direct to the operating expense accounts or to the clearing accounts."

Under this heading should be inventoried office furniture and fixtures, general shop equipment, general store equipment, general stable and garage equipment, and all of the miscellaneous tools and implements used in maintaining the plant.

It is hardly necessary to give a detailed outline of the method of procedure, for inventorying the equipment falling under Account 260 and sub-accounts 261-265 inclusive. The instructions quoted in the following paragraphs clearly specify the nature of the equipment to be included under each of these accounts and these, together with the suggested precautions, should be sufficient. The inventory resolves itself into a process of accurately counting and summarizing the equipment involved.

192. *Office Furniture and Fixtures, Account 261.*—"This account should include the cost of desks, tables, chairs, carpets, cases, movable partitions, railings, shelves, typewriters, addressing machines, adding machines, and other office devices; stoves, portable gas and electric fixtures, and other office fittings (except fittings considered a part of the building as provided for in Account No. 212, 'Buildings,' and telephone equipment provided for under Account No. 220, 'Central Office Equipment')."

The inventory of the office furniture and fixtures is a comparatively simple matter. It is usually advisable to subdivide this portion of the inventory according to the location of the equipment involved, i. e., make a complete separate inventory of the furniture and fixtures in the manager's office, in the general office, in the storeroom, etc.

In this connection attention is called to the portion of the Interstate Commerce Commission's accounting instructions enclosed within parenthesis. Special fittings which are a part of the buildings should be inventoried under the Building Account, No. 212, and not under furniture and fixtures. Movable partitions, counters, railings and shelves should be inventoried under furniture and fixtures, while stationary railings and counters, which are obviously a part of the building itself, should be inventoried under the heading "Buildings."

193. *General Shop Equipment, Account 262.*—"This account should include the cost of all equipment specially provided for general shops, such as engines, gas producers, electric generators, and other power apparatus used in operating machinery in such shops; machine tools, shafting, belts, and like shop equipment; also such smithing equipment in general shops as is used principally for general purposes other than shoeing horses and repairing vehicles.

"Hand and other small portable tools liable to be lost or stolen should not be included herein, but portable tools and apparatus of special value may be charged to this account and remain herein so long as record is kept of such tools and apparatus."

In connection with the inventory of the general shop equipment, special attention is called to the last paragraph of the foregoing Interstate Commerce Commission's accounting system instructions. All of the small portable tools, which frequently have to be replaced, should be omitted entirely from the inventory. The cost of these items is obviously a part of the operating expense.

194. *General Store Equipment, Account 263.*—"This account should include the cost of all equipment of general store structures, such as movable counters, movable shelving, and other movable equipment of like nature; carts, barrows, trucks, tools, etc., and other apparatus and appliances used in handling, storing, or packing materials and supplies.

"Counters, shelving, and the like which are permanently attached to the structure should be charged to Account No. 212, 'Buildings,' and not to this account."

In inventorying the general store equipment, it is most important that permanent counters, shelving and fixtures—which are obviously a part of the building—should be included with the cost of the building and not listed under the heading "General Store Equipment."

195. *General Stable and Garage Equipment, Account 264.*—"This account should include the cost of all equipment of general stables, including horses, harness, drays, wagons, automobiles and other vehicles; equipment of shoeing shops, harness-repair shops, vehicle-repair shops, etc."

It frequently happens that a large portion of the stable and garage equipment of a telephone company consists of second-hand automobiles, motorcycles, wagons, trucks, etc. It is most important that the reproduction cost assigned to this portion of the equipment should be reproduction new and not actual cost to the company. Many appraisers make the mistake of appraising second-hand material at the cost to the owner. This is obviously wrong and entirely inconsistent with the reproduction cost theory.

To facilitate a clearer understanding of

this matter of the appraisement of second-hand equipment the following illustration is given:

A telephone company possessed of a number of second-hand Ford cars desires a one-ton truck for material distribution purposes. It finds that by utilizing various automobile parts at hand, it can build up a truck of the desired capacity at a comparatively small cost. Assuming that the one-ton truck resulting from this makeshift perfectly meets the requirements for which it was designed, the reproduction cost of the truck would be the prevalent market price of a standard truck of the same horsepower and capacity of the one in question.

The fact that the truck under consideration is a makeshift, and not the exact equivalent of a new truck of standard make, can be cared for in the determination of the present, or depreciated value.

196. *General Tools and Implements, Account 265.*—"This account should include the cost of portable testing apparatus and valuable tools and implements devoted to the maintenance or construction of the telephone plant and not provided for in the equipment accounts. This does not include tools not yet in use carried as supplies unissued."

In inventorying general tools and implements it is important that the precaution outlined under general shop equipment, section 193, should be carefully observed, i. e., "Hand and other small tools liable to be lost or stolen should not be included herein, but portable tools and apparatus of special value may be charged to this account and remain herein so long as record is kept of such tools and apparatus."

197. *Material and Supplies, Account No. 122.*—"This account should include the cost of unapplied material, including the value of material temporarily in use and not charged out in the company's accounts; articles in process of manufacture by the company; tools, fuel, stationery, and other supplies. Freight and express charges paid on the material included in this account should be included in the value of such material."

There is little that can be said regarding the inventory of material and supplies, except that the equipment involved should be described in sufficient detail to properly effect its subsequent identification and appraisement. It will usually be found that the company has a reasonably accurate inventory and the use of this inventory will probably considerably expedite the work.

198. *Right of Way, Account 207.*—"This account should include the cost of all land and interests in land acquired for the location of telephone wires, cables, pole lines, and conduits; salaries and expenses of right-of-way agents; expenses of appraisals and of juries, commissioners, or arbitrators in condemnation cases; real-estate brokers' commissions; cost of plats, abstracts, notarial fees, examination of title, recording deeds, etc.

"This account should also include the first cost of acquiring leaseholds of land for right of way, the terms of which are more than one year each, whether acquired through direct lease, assignment, or otherwise (but not including the rents paid periodically in consideration of rights obtained under such leases). If any such leasehold is acquired by assignment, the charge to this account must not exceed the amount actually paid therefor by the accounting company to the assignor."

The inventory of the right of way may be divided into three general classifications:

1. Right of way for poles located on public highways.
2. Right of way for poles located on private property.
3. Right of way for telephone cables, wires and cross arms placed on the poles of foreign utility companies.

It will be remembered that the field form for pole line equipment provides a space for tabulating poles located on private property. The total of these poles subtracted from the grand total of all the poles inventoried, will give the number of poles located on public highways.

By reviewing the field data it will be possible to ascertain accurately the number of the telephone company's attachments on foreign poles. The resulting data, together with the inventory of poles on private property and public highways, should be supplemented by a careful check of the company's records.

199. *Next Step in Appraisement.*—In a very general way all of the elements involved in the inventory of a telephone property have been discussed. It must be realized that the method of procedure outlined is merely intended as a guide and that the individual requirements of specific cases may necessitate the adoption of radical modifications of the plan suggested.

The next step in the appraisement of the inventoriable property is the preparation of the unit costs and this problem will be considered in detail in the following chapter. *(To be continued.)*

Rate of Telephone Increase in Chicago This Year.

During the first three months last year, the Chicago Telephone Co. gained 13,000 telephones, while for the same period this year the gain is 15,000 — 12,200 in the city and 2,800 in the suburban division. The gain is in excess of 60,000 telephones a year, and is greater than ever before and fairly represents the feverish activity produced by the war conditions.

As a matter of fact, 28,000 telephones were put in in the three months, but 13,000 were taken out. A normal and satisfactory condition is to put in two telephones to gain one, but the showing is slightly better than this now. In 1914, when business conditions were bad, two telephones were taken out for every one put in, for several months, and this condition will likely return for a time at the close of the war.

There is a constantly increasing difficulty in adding new telephones because of the shortage of material of all kinds. The supply of almost everything that goes into the building of a telephone exchange is about exhausted and little can be had, even at almost double the old prices. There will be unusual delays in filling orders for new telephones, and many cannot be filled at all.

Vermont Consolidation Not Independent Merger.

In TELEPHONY of June 9, page 33, was published an item relative to the consolidation of the Champlain Valley Telephone Co., of Brandon, Vt., and the Passumpic Telephone Co., of Newport, Vt., with the New England (Bell) Telephone & Telegraph Co. Upon communicating with Vice-President F. B. MacKinnon of the United States Independent Telephone Association as to whether this constituted a merger of Independent properties, he has advised us as follows:

"The New England Telephone & Telegraph Co. has owned stock in the Champlain and Passumpic companies for several years, and is now merging the two companies with the parent organization for operating reasons."

Sale of Hodgenville (Ky.) Telephone Properties.

The assignee's sale of the property of the LaRue County Telephone Co., of Hodgenville, Ky., to a group of Hodgenville and Lebanon men has been approved by the circuit court and accepted by all parties.

The property includes exchanges at Hodgenville and at Buffalo, Ky., and was sold for $2,800. T. B. Kirkpatrick is one of the principal stockholders of the new owning concern, which has not as yet completed organization, and is in charge of the system. Mr. Kirkpatrick states that the company will make extensive improvements in the plants and wire systems.

Funeral Sermon Delivered Over the Telephone.

Prevented from attending the funeral of the Rev. John Smith of Oakfield, Wis., in person, when his automobile became stalled in snow near Green Lake, the Rev. Robert Ingrahm, of Fond du Lac, delivered his funeral sermon over the long-distance telephone. Rev. Walter A. Hall received the dictation and delivered the message to those attending the service.

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Toll Business Should Absorb Proper Portion of Expense.

The Wisconsin Railroad Commission, in its opinion in the case of the Rosendale Telephone Co. vs. the Wisconsin Telephone Co., relative to toll commissions, states that it is unable to agree with the contentions of the respondent that the only payment which should be made to a sub-licensee company for toll service should be payment for the actual additional expense to which the sub-licensee is put because of handling the toll business.

The commission is of the opinion that toll business is not an incidental and unimportant branch of the telephone business, and it sees no adequate reason why the exchange business should absorb expenses which, if a proper basis of apportionment were applied, would be assigned to the toll business. The handling of toll business, at least toll business of the magnitude and extent of that of the Wisconsin Telephone Co., cannot be regarded as a subordinate function of a telephone company.

"The principle of apportioning expenses among the various utility divisions of a joint utility, as for example, a water, gas, and electric plant," the commission's opinion recites, "is generally recognized as sound. No branch of such a business is dealt with as incidental so that it would be charged with only the actual additional expenses incident to its operation in connection with other branches.

"If the principle of apportioning expenses among the various departments of a joint utility, which has been generally applied by this commission, is correct, it seems to us to be equally true that the telephone business in its present day development consists of two co-ordinate branches, exchange service and toll service, and that assigning to either only the additional expenses occasioned by adding that branch where only the other had previously been furnished, fails to meet the requirements of an equitable distribution of expenses."

The other argument of the Wisconsin company, that the toll business should carry expenses from toll board to toll board only, and that between the toll board and the subscribers' station, toll messages should be regarded as a part of exchange business, the commission states, is one which probably will have to be definitely passed upon before the proper basis for connecting company toll commissions, in general, can be determined.

In the case in question complaint was filed by the Rosendale Telephone Co., of Rosendale, Wis., against the Wisconsin Telephone Co., in which it alleges that it is receiving insufficient compensation for handling toll business originating and terminating at Rosendale, especially as no payment is made for handling incoming business.

The Rosendale company is at present receiving 15 per cent. commission on originating messages and $75 a year additional.

As the records in the case do not show that the volume of incoming toll business greatly exceeds the originating calls, the commission is of the opinion that the contention of the company that it should receive specific payments to cover the expense to which it is put in connection with handling incoming toll business is not well grounded. A percentage of outgoing tolls, or a percentage of such toll plus a fixed sum, along the lines of the present method of payment, the commission believes will constitute a fair basis.

For the reasons set forth the commission was of the opinion that the present method of settlement for services rendered by the Rosendale Telephone Co. should be approved and the case was accordingly dismissed. Ruling U-708 handed down June 13.

South Dakota Rural Company Ordered to Comply with Statutes.

Another case has just been ruled upon by the South Dakota Railroad Commission, in which a company was found to be violating some of the South Dakota statutes. Complaint in this case was brought by A. G. Latta against the Medicine Valley Telephone Co., which operates a rural telephone line in the vicinity of Blunt and Harrold.

The record shows that it requires intending subscribers to construct the extensions or connecting lines and furnish telephone instruments. At the present time the majority of its subscribers, whether stockholders or not, own the telephone instrument through which they are receiving service.

The company furnishes at least one of its non-stockholder subscribers with all the equipment, including an instrument. All of its stockholder subscribers and those non-stockholder subscribers who furnish their own telephone instruments, receive service at a rate of $12 per year per telephone, while the rate charged the non-stockholder subscriber, to whom the company furnishes the equipment, is $18 per year. This, the commission holds, is clearly a discrimination, and the company is ordered to discontinue the practice.

The company is also ordered to take over, by purchase, all of the equipment at present owned by its individual subscribers, establish a schedule of reasonable rental rates, and require that the rates established are charged and collected from each of its subscribers alike for the same class of service.

Some question arose at the hearing as to the distance a telephone company might be compelled to construct lines in order to furnish service in the territory served. The commission has held in numerous cases that a company might be compelled to construct lines a reasonable distance. What a reasonable distance is, would depend upon the facts in each case, and might vary considerably in different localities.

If the party desiring service resides at more than a reasonable distance from the line, and it is agreeable to such party to assist in the construction of the line or the furnishing of equipment, such a practice might be permitted under an arrangement that the equipment when installed would belong to the company and be maintained by it.

The company is further ordered to eliminate from its by-laws certain sections, which are in violation of the statutes, to readjust its affairs in conformity with the law as its exists and to put into effect rules and regulations in conformity with good telephone practice. F-395.

Physical Connection Controversy at Pauline, Neb.

The Glenwood Telephone Co. has refused the challenge of the Lincoln Telephone & Telegraph Co., to go into the courts and test the Nebraska law requiring physical connections of all telephone companies. In a document filed with the state railway commission, it specifically says that it is not now seeking an order for connection, but to ask that an unjust discrimination against its Pauline exchange cease.

The reply sets up that the Glenwood company comprises 12 exchange districts, with 11 of which the Lincoln company maintains the usual connections, but because the twelfth district includes the town of Pauline, where the Lincoln company also has an exchange, messages originating there get no farther than the Hastings toll board. Hastings is the

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county-seat town for Pauline people, and the real fight is to secure connection therewith.

The Glenwood company declares that it is a public utility and engaged in the sale of service to the public, controverting the claim of the defendant that it is a mutual and not amenable to the state regulatory laws. It sets up that the people of Pauline were denied the fulfillment of a promise of the Lincoln company, that it would give modern service there, and that as a result a new district exchange was created. Without the solicitation of the Glenwood company and against its advice, this was done, but after it was accomplished it was made a part of the company.

It is further set up that the Lincoln company is threatening to cut off all service to the 11 other districts if the Glenwood corporation does not cease its efforts to secure equal service for Pauline. It avers that all districts are on a par, and under the law entitled to equal treatment. It is asserted that the Lincoln company has so districted the field that neighbors in the country a mile apart cannot talk with one another except in a roundabout way, and by the payment of a toll charge.

The reply further sets out that no interstate commerce is in question, but that the action of the Lincoln company deprives and grossly hampers service to other state points. The Glenwood company claims the right to turn over messages on its lines wherever it sees fit, and that as the public necessity and convenience requires that Pauline subscribers have connection with their county-seat town it seeks such an order.

Close Figuring in the Matter of a Rate Increase.

The close figuring that the small town telephone companies must do is illustrated in the application, recently granted, of the Coleridge (Neb.) Independent Telephone Co., for a boost in rates, which involved as slight an increase as 1⅔ cents a month. The company is one of a numerous kind that began by every subscriber being forced to buy his own instrument, but which developed into the furnishing of telephones to new subscribers by the company itself.

The state railway commission's investigation showed that the property was unproductive of returns, and granted the request, which was a carefully constructed effort at readjustment in order to reduce the spread between the two kinds of service, that to subscribers owning telephones being too low. The result will add $400 to the gross revenues yearly.

As an instance of the close figuring done, the company asked for an increase of from 83⅓ cents a month for residence service given to telephone-owning subscribers to 85 cents a month. At the same time it reduced the company-owned party line telephone service from $1.16⅔ a month to $1.15, while raising the price 8⅓ cents a month for similar individual residence service. Business rates were raised from $1 to $1.25, where the patron owns the telephone, and from $1.33⅓ to $1.50 where the company owns it. Rural rates were raised 16⅔ cents a month.

The company has an investment of $16,000, a gross income of $4,252, and supplies service to 122 persons in town and 230 in the country.

Advance Collection of Telephone Rentals in South Dakota.

In ruling upon a recent application of a South Dakota telephone company, for permission to collect its rates quarterly in advance, the railroad commission gives the following opinion on the question of collecting a higher rate where rentals are not paid promptly in advance:

"Many of the telephone companies in this state have in effect a higher rate where its telephone rental rates are not paid promptly and in advance. The practice works well and we believe is in the interests of the telephone company and the public. The practice is permitted in order to protect the public and the telephone company against loss arising because of failure of its subscribers to pay their rent, or, in other words, from bad accounts, and to reduce the cost of collection to the lowest possible point.

Practically the only source of revenue which the company has is secured from the rates received for the service it performs, and if a large part or any part of the rates remain unpaid, this additional burden falls on the remaining subscribers. If the amount lost through this means is large, it necessarily follows that an increase in rates and higher charges for telephone service must result."

Ohio State Company to Increase Rates in Youngstown.

Rate increases for business and residence telephones in Youngstown are announced by the Ohio State Telephone Co. The new schedule filed with the state public utilities commission becomes effective July 1.

The net rate for residence lines is not affected, however, providing the bill is paid by the 15th of the month, in which case a 25-cent discount makes the cost to the subscriber the same as before. Main line business service stands the largest proportion of the net increase. Two and four-party business service are given net increases of 50 cents per month.

Service will be billed monthly in advance as follows: Main line business, $4.75; two-party business, $3.25; four-party business, $2.75; main line residence, $2.25; two-party residence, $2; four-party residence, $1.75.

The company's plan is to discontinue its practice of having bills presented by local collectors and through the discount give the subscribers the benefit of the savings thus made.

Objects to Closing of Exchange During Sunday Noon Hour.

A Nebraska preacher, the Rev. C. R. Calme, objects to the closing of the telephone exchange in his home town of Whitney during the noon hour on Sunday, and has complained to the state railway commission about it. This is one of several reductions in the service about which he complains.

An investigation made by the commission, after it had recovered from its astonishment over a clergyman insisting upon Sunday labor, disclosed that the company has but one employe, a girl, who goes to work at 6 o'clock in the morning and takes an hour off at noon and supper time. The exchange closes at 9 o'clock, but in order to take care of emergency calls she sleeps in the office.

The commission has written the preacher that it will not require her to remain there while the Sunday dinner is on the table, and that the exchange may be properly closed that hour.

Hearings in New Jersey on Delaware & Atlantic Rate Case.

Having concluded the hearings on the question of fixing new rates for the New York Telephone Co., in which no decision has yet been given, the New Jersey Public Utilities Commission on June 11 took up a study of the financial condition and business of the Delaware & Atlantic Telephone and Telegraph Co., the Bell company operating in the southern section of the state.

It was regarded as not unlikely that the company might ask for an increase in rates in the territory covered by the Delaware & Atlantic. The figures obtained by the state experts are said to indicate the company is not operating profitably. If the company does not ask for an increase in the South Jersey rates, it was believed possible that the Bell interests might utilize the showing of the Delaware & Atlantic as a reason for permitting the merger of that concern with the New York Telephone Co., operating in the northern half of the state.

Hearings in that case indicated the New York company was making excess earnings of $600,000 to $800,000 a year. With a merger effected, the consolidated company would be in a position to balance the losses in south New Jersey against part of the excess profits in that part of the state. This plan—which is construed as amounting in effect to burdening north New Jersey for the benefit of south New Jersey—is opposed by north New Jersey interests. Meanwhile, the public utilities commission has failed

to decide on the application of the Bell interests to permit the merger.

At the hearing the statement was elicited from President Donges of the board that the proceedings in the Delaware & Atlantic case would be carried on independently of the proposition to merge.

The first witness on the stand was John L. Petty, an expert accountant employed by the commission, who made an examination of the books of both the New York and Delaware & Atlantic companies. He testified that the cost of reproducing the plant of the latter would be $6,070,765 as of June 30, 1916. Without allowing for depreciation, he figured, the value of the plant would be $8,960,762. This latter figure includes the value of the Interstate Telephone Co.'s plant, which was taken over by the Delaware & Atlantic company recently.

The basis of valuation of the company's property was on a continuation system, using the figures found by the commission in the Gately & Hurley and residents of Camden suit against the company in 1911. At that time the commission dismissed the suit in the company's favor, declaring that the company was earning but 3.2 per cent. on the minimum valuation and but 2.5 per cent. on the maximum valuation. The figures found by Mr. Petty showed that the company's earnings in 1916 were $141,606, which based on the estimated valuation on June 30 last year was only a net return of 2.07 per cent. on the capital invested. On the book values found by him the earnings amounted to but 1.87 per cent. for the year.

Robert V. Marye was present, representing the company, and his only objection was against the valuation found by Mr. Petty in estimating the company's assets on the basis of the decision in the Gately & Hurley case. He was of the opinion that the valuation was considerably less than the company could show.

Interpolated into the concluding hearing on June 13 was the question whether the commission, before fixing the schedule, should require the company to pay higher wages to its employes. The point was brought up by Miss Juliet Cushing, a representative of the National Consumers' League.

The witnesses heard were Harland A. Trax, chief accountant of the eastern division of the Bell companies, and James L. Kirkpatrick of the engineering department of the Bell companies of Pennsylvania and associated companies. Testimony by Mr. Trax was introduced to offset calculations made by the commission's financial expert, Mr. Petty. Mr. Kilpatrick presented information relating to the condition of the Delaware & Atlantic plant.

At the conclusion of the hearing Commissioner Slocum announced that the argument on the Delaware & Atlantic rates would be heard by the commission at the same time as the argument on the New York rates, June 21.

Physical Connection Upheld by Indiana Supreme Court.

The Indiana Supreme Court, on June 6, handed down a decision affirming the decision of the public service commission ordering the Whitley County Telephone Co. and the Farmers Mutual Telephone Co., of Columbia City, Ind., to effect a physical connection between their systems.

Action in this case was started in 1915 by Whitley County Telephone Co. when it asked for an order from the public service commission for physical connection with the Farmers Mutual company. Judge McClure, a member of the commission, heard the case and rendered the verdict that the companies should connect. The Farmers' Mutual took an appeal to the circuit court, asking that the order of the commission be set aside. Judge Wrigley took the evidence and confirmed the commission's order.

Meantime other evidence had been submitted to the commission, which subsequently rendered a second order, much the same as the first. An appeal from this order was taken to the Whitley circuit court, and has been pending for want of a judge to handle the case. It will have little bearing on the present situation, however.

The Whitley County Telephone Co. served notice at the time of the order that it was ready to connect up at once.

Public Telephones in New York Subways Assured.

After a long and difficult struggle, the people of New York City have finally succeeded in their efforts to have public telephones installed in rapid transit stations of the city. The conditions have been agreed upon by all concerned and as soon as certain details can be worked out the New York Telephone Co. will begin installing the telephones.

The telephone company already has completed its survey of the Brooklyn Rapid Transit Co. preparatory to installing the service. The survey of the Interborough Rapid Transit Co. stations has not been finished, but enough has been done, it is stated, to permit installation of some of the telephones when negotiations are finished between the rapid transit companies and the telephone company through the public service commission.

The survey presented many nice engineering problems. In some stations the matter of vibration caused by the heavy express trains which would affect the wiring caused difficulty in finding suitable places for the booths. The surveys were made first with a spot tentatively marked for placing the booth. If the engineers found it impossible to string the wires to this point the location of the imaginary booths was changed. Placement of the booths also had to be made where the noise of passing trains would disturb telephonic conversation the least.

Proposed Merger of Telephone Plants in Waxahachie, Texas.

Proposal was made at a meeting of the city council on June 6 to merge the two telephone systems operating in Waxahachie, Texas, and a draft of an ordinance drawn for this purpose was passed to its first reading. Under the terms of the merger plan the Texas Long Distance Telephone Co. is to take over the Southwestern exchange in Waxahachie.

Summary of State Commission Hearings and Rulings.

ILLINOIS.

May 14: Commission approves joint contract of receivers of Central Union Telephone Co. with Emington Telephone Co. dated April 14, 1917, providing for the joint operation of their lines at Emington, Ill. No. 6699.

May 14: Joint contract of Arthur Mutual Telephone & Telegraph Co. with Farmers & Merchants Telephone Co., of Lovington, dated October 14, 1916, providing for the joint operation of their lines at Lovington in connection with each other, approved. The commission reserves jurisdiction of the subject matter of the case for the purpose of making changes in its terms should it ever become necessary. No. 6177.

May 14: Commission approves joint contract of receivers of Central Union Telephone Co. with Free Line Telephone Co., of Forrest, Ill., dated February 5, 1917, providing for the operation of the lines of the Free Line Telephone Co. By the terms of the contract the receivers are to switch the service trunk lines of the Free Line Telephone Co. extending from Forrest to other towns in that vicinity.

The commission reserves jurisdiction of the subject matter of the contract for the purpose of making changes in its terms should it become necessary. No. 6549.

May 14: Permission granted Chas. E. Patterson to sell to the Illinois Telephone Co., of Jacksonville, for the sum of $300 his rural telephone lines located one and one half miles north of Jacksonville, Ill. No. 6370.

May 14: In the case of Wrights Telephone Co. (E. S. Barnard, et al.), permission was granted to Wrights Telephone Co. to sell to the Illinois Telephone Co. its plant and equipment in the village of Wrights and rural lines connected thereto for the sum of $3,000 cash, the transfer to be made in 31 days. The Wrights Telephone Co. is to discontinue the operation of its system. Certificate of convenience and necessity also granted to the Illinois Telephone Co. to operate the telephone plant so purchased in the village of Wrights. No. 6371.

May 14: C. S. Miller vs. receivers of Central Union Telephone Co. Complaint of unsatisfactory service, stating that the only station of the receivers at Mound City is in a drug store, and that a great

deal of time is lost in answering calls and placing calls, as it necessitates many trips to the drug store; also asking that the commission compel the receivers to make a physical connection with the Home Telephone Co. of Cairo.

The parties have agreed upon and stipulated that the physical connection be made and the commission authorizes such connection. The parties are to have 60 days to agree upon terms of the connection. If terms are not agreed upon within 60 days they will be fixed by the commission. No. 6276.

May 14: Permission is granted to the Crescent Telephone Co. to increase its rates from $15 per year to $18 for business telephones, a 25-cent per month discount being provided for payment in advance at the first of every quarter. The increase is to provide increased revenue and to facilitate collections. No. 6065.

May 14: Permission granted Chicago Telephone Co. to sell real estate in city of Chicago to Irving Park Lodge for the sum of $7,000. Describes real estate sold in order. No. 6700.

May 14: Authority granted Heyworth Telephone Co. to issue its promissory notes aggregating the sum of $24,000. No. 6543.

May 14: The Shiloh Mutual Telephone Co., of Huntsville, Ill., is authorized to establish a rate of $8 per year for party line telephones and call bells, such rate to become effective June 1, 1917, and to be filed, posted and published as provided by the public utilities act.

The Shiloh Mutual Telephone Co. has heretofore maintained a 12-hour service and has recently inaugurated a full 24-hour service and in its petition filed in this case asked to be permitted to put into effect a charge of 25 cents per call or message for all calls handled through its switchboard between the hours of 9 p. m. and 7 a. m. This latter request the commission refused to grant, finding such a charge to be unreasonable. Concerning this point the commission said: "A continuous 24-hour service will be of equal benefit to all of the petitioner's subscribers, and if the furnishing of such service results in an increase in the operating expenses of the company, such increase should be borne equally by all subscribers; and if the proposed flat rate of $8 per year does not produce sufficient revenue, a further increase should be made rather than a charge for each call or message, as proposed." No. 6037.

May 14: The Melvin Telephone Co. is ordered to furnish an all day Sunday service in Melvin, Ill., instead of a three-hour service heretofore furnished on Sundays. In order to provide for the added expense necessary to furnish such service and other increases in operating expenses which the company is facing, the company is authorized to increase its telephone rates from $1 to $1.50 per month, allowing a discount of 25 cents per month if paid quarterly in advance. No. 6159.

June 19: Hearing in Chicago in the case of the City of Peoria vs. the receivers of the Central Union Telephone Co., on the petition of the City of Peoria to compel the Central Union company to reduce its telephone rates in Peoria. Cross petition of receivers of Central Union company filed. No. 3043.

June 19: Hearing in Chicago on the complaint of the Boone County Telephone Co. that the Farmers Union Telephone Co. is extending its telephone lines into the territory of the complainant in the southwestern part of Boone county. Application for rehearing filed by Boone County company. No. 5073.

June 21: Hearing in Chicago on the application of the Dixon Home Telephone Co. to increase its rates for telephone service in Dixon. Protest filed by the city of Dixon. No. 6466.

June 22: Hearing in Chicago in the case of Myer J. Stein, of Chicago, vs. the City of Chicago and the Chicago Telephone Co., on complaint as to service and rates of defendant company at Oak Park. No. 5285.

MISSOURI.

July 7. Hearing on the question of allowing an increase in rates for both business and residence telephones by the Southwestern Bell Telephone Co. at Springfield, set for this date, has been indefinitely postponed.

NEBRASKA.

June: The commission has asked telephone companies to report the hours of service in force at each telephone exchange. No such information is on file in the commission's office. Because many complaints filed with the commission are in regard to the hours of service the commission must have this information at hand.

June 11: Complaint of C. A. Collander that Tri-County Telephone Co. refuses to establish a night rate from Stapleton to North Platte. It appearing to the commission that the company revenues but equal expenses, complaint is dismissed unless complainant can show that a lower rate for night messages would increase such revenues.

June 11: Application of Union Telephone Co., of Wausa, to establish installation and removal charges; permission granted to publish standard schedule.

June 11: Application of Lincoln Telephone & Telegraph Co. to cancel four-party business rate of $3.50 a month in towns of Davey, Malcolm, Waverly and Raymond, with free service in Lincoln zone. It appearing to the commission that it is inadvisable to disturb the present adjustment of rates in that zone, application is denied, no such service being furnished at the present time.

June 11: Application of Southeast Telephone Co., of Falls City, for permission to charge $1.25 a month for individual residence service. It appearing that the company, although operating 1,300 telephones, has paid no dividends in years, this increase of $3 a year is granted.

June 12: Application of Lincoln Telephone & Telegraph Co. for permission to install metallic service rates upon Syracuse exchange; permission granted to establish optional service. The proposed rates are: Business, $2.50; individual residence, $1.50; two-party residence, $1.25. The old rates for grounded service are: Business, $1.75; residence, $1.25.

June 12: Application of Coleridge Telephone Co. for permission to establish a new schedule of rates; granted.

June 12: Application of Hoskins Telephone Co. for permission to increase switching rate from $3 to $4 a year; granted.

June 14: Complaint filed by Michael O'Connor that the Greeley Telephone Co., after his removal from one farm to another, refuses to give him a telephone upon the same party line with which he was formerly connected and upon which his old friends are located. The company says that this would require building half a mile of pole line and asserts its right to give service on nearest line not filled.

June 14: Complaint of O. L. Hodgson that Lexington Telephone Co. refuses to install telephone.

NEW HAMPSHIRE.

June 8: Hearing on the petition of the Henniker (N. H.) Telephone Co. for an order requiring the Contoocook Valley Telephone Co. to exchange service in Henniker, Hillsboro, Warner and Deering.

PENNSYLVANIA.

June 11: Complaint of Anne T. Scribner, of Melrose, against the telephone divisions of suburban Philadelphia service dismissed. The commission held that in the telephone business zone lines must be established some place and it can find no cause to interfere.

SOUTH DAKOTA.

June 9: The commission granted the application of the Carthage-Esmond Telephone Co. to increase its rural rates from $10 per year, net, to $13.50 per year for one exchange service and $15 for two exchange service.

The company is also granted permission if it so desires, to name a rate 25 cents a month in advance of these rates from which a discount of 25 cents per month will be allowed if the rental is paid quarterly in advance, the payment to be received during the first month of the current quarter. The valuation placed upon the company's property by the commission was $1,700. Inf. Docket 2514.

June 9: The commission granted the application of the Nebraska Telephone Co. for authority to increase its extension bell rates at its exchanges in Dallas, Fairfax, Burke, Witten and Herrick, from $2 to $3 per annum. Order 2454.

June 9: Application of the Nebraska Telephone Co. for permission to cancel its grounded line telephone rates for exchange service in Bonesteel granted. All but two of the company's subscribers have been cut over to metallic lines and the commission finds that public convenience does not require the furnishing of grounded line service in Bonesteel. The company's rate of $3 per year for extension bell service is also approved. Order 2455.

June 9: Upon complaint of A. C. Latta, the Medicine Valley Telephone Co., of Blunt, is ordered to establish a reasonable schedule of telephone rentals, to acquire ownership and control by purchase or agreement of all of the equipment, including telephone instruments, that is at present owned by its individual subscribers; to eliminate certain sections of its by-laws which are in violation of the statutes and to establish by-laws and rules in conformity with existing law and good telephone practice and submit copy to the commission for approval. F-395.

WISCONSIN.

June: Marshfield (Wis.) Telephone Co. has been authorized to increase its rates, effective July 1, as follows: Residence telephones from $1.25 to $1.75 a month; business telephones from $2.50 to $2.75 a month. The rate for rural business telephones is reduced from $2.50 to $1.50 a month and the company is authorized to collect all of its rentals in advance.

June 13: The commission dismissed the complaint of the Rosendale Telephone Co. vs. the Wisconsin Telephone Co., in which the complainant alleges that it is receiving insufficient compensation for handling toll business originating and terminating at Rosendale. The company is at present receiving 15 per cent. commission on all originating calls, and $75 per year additional, which the commission believes is adequate compensation. U-708.

More Pen and Ink Honors for the Bell Company.

(*Concluded from page* 14)

him by appointing a sub-committee on communications.

On this sub-committee he appointed the following members. Theodore N. Vail, chairman; Newcomb Carlton, president of the Western Union Telegraph Co.; Chas. P. Bruch, vice-president of the Postal Telegraph Co.; N. C. Kingsbury, vice-president of the American Telephone & Telegraph Co., and F. B. MacKinnon, vice-president of the United States Independent Telephone Association.

To Mr. MacKinnon was assigned, specifically, the duty of carrying on the work with the Independent telephone companies of the country, whom he represented on the committee. Mr. MacKinnon represented the national Independent telephone association; the national association represented the Independent telephone companies.

Mr. MacKinnon, as all Independent men know, divided the country into certain districts, and formed a number of group organizations of Independent companies. These group organizations elected their own officers, and began the work of recruiting Independent men for the signal service corps, and of preparing Independent telephone companies to render efficient and valuable service to the government during the war. The group organizations are active also in the sale of the Liberty Bond issue, and in other similar work.

If any one had had to induce the Independent telephone companies to do their "bit," that someone would have been Mr. MacKinnon, and the United States Independent Telephone Association. But they did not have to be persuaded. Mr. MacKinnon and the officers of the national association will tell you that they met, everywhere, with the most hearty response to their suggestions, and with the most willing co-operation in thework.

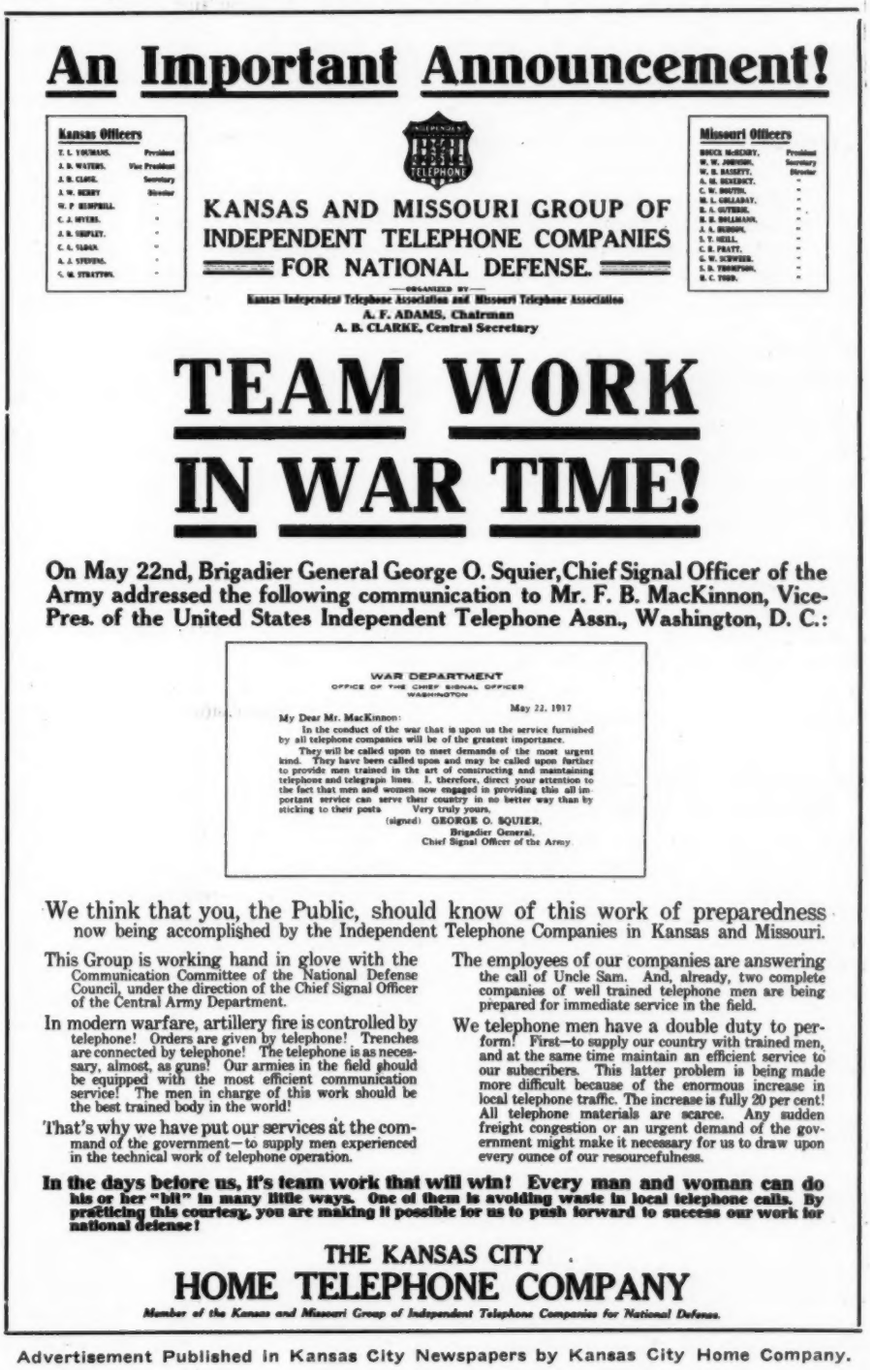
The Independent telephone companies, throughout the country, met the issue squarely and put their resources behind the plan. The national association found them willing and anxious to know what was to be done and found them willing and ready to do it. There was no coercion; there were no threats, pleadings or "inducements." They were not necessary.

To say that Mr. Vail induced the Independent telephone companies to do their part does Mr. Vail an injustice. It places him in a false position and in one that we are quite sure he did not knowingly occupy. It also reflects upon the patriotism of the Independent companies. World's Work should correct the statement, and at once. The Independent telephone companies of America do not have to be induced to do their duty to their country.

Publicity for the Independent Companies and the War.

The newspapers all over the country have for several months contained items relative to the work which the Bell companies are doing in the raising of battalions for the United States Signal Reserve Corps, and of other work which it is doing to co-operate with the various departments of the government during the war. The result is that the Bell companies have received a tremendous amount of publicity. The Kansas City Home Telephone Co., Kansas City, Mo., has recently been publishing an advertisement in the Kansas City papers, which is reproduced on this page. In this advertisement the public is given the full facts, and advised as to the actions and difficulties which the telephone companies will encounter during the war.

The announcement has been sent out to the Independent telephone companies in the Kansas and Missouri group, of which A. F. Adams, of Kansas City, is chairman, with the recommendation that it be published in the local papers, the name of the local Independent company being inserted in place of the Kansas City Home company. In cases where there are no local newspapers it is suggested that the announcement be posted in the post office, or some other equally public place.



An Important Announcement!

Kansas Officers

T. L. YOUMANS.	President
J. D. WATERS.	Vice President
J. B. CLOSE.	Secretary
J. W. BERRY	Director
W. P. HEMPHILL	
C. J. MYERS.	"
J. B. TRIPLEY.	"
C. C. VADEN	"
A. J. STEVENS.	"
C. M. STRATTON.	"

Missouri Officers

BRUCE McHENRY.	President
W. W. JOHNSON.	Secretary
W. B. BASSETT.	Director
A. M. BENEDICT.	"
C. W. BOUTIN.	"
W. L. GALLADAY.	"
E. A. GUTHRIE.	"
R. B. HALLIBURN.	"
J. L. HUDSON.	"
I. T. HULL.	"
C. E. PRATT.	"
G. W. SCRIVNER.	"
L. D. THOMPSON.	"
H. C. TODD.	"

KANSAS AND MISSOURI GROUP OF INDEPENDENT TELEPHONE COMPANIES FOR NATIONAL DEFENSE.

ORGANIZED BY
Kansas Independent Telephone Association and Missouri Telephone Association
A. F. ADAMS, Chairman
A. B. CLARKE, Central Secretary

TEAM WORK IN WAR TIME!

On May 22nd, Brigadier General George O. Squier, Chief Signal Officer of the Army addressed the following communication to Mr. F. B. MacKinnon, Vice-Pres. of the United States Independent Telephone Assn., Washington, D. C.:

WAR DEPARTMENT
OFFICE OF THE CHIEF SIGNAL OFFICER
WASHINGTON

May 22, 1917

My Dear Mr. MacKinnon:

In the conduct of the war that is upon us the service furnished by all telephone companies will be of the greatest importance.

They will be called upon to meet demands of the most urgent kind. They have been called upon and may be called upon further to provide men trained in the art of constructing and maintaining telephone and telegraph lines. I, therefore, direct your attention to the fact that men and women now engaged in providing this all important service can serve their country in no better way than by sticking to their posts.

Very truly yours,
(signed) GEORGE O. SQUIER,
Brigadier General,
Chief Signal Officer of the Army.

We think that you, the Public, should know of this work of preparedness now being accomplished by the Independent Telephone Companies in Kansas and Missouri.

This Group is working hand in glove with the Communication Committee of the National Defense Council, under the direction of the Chief Signal Officer of the Central Army Department.

In modern warfare, artillery fire is controlled by telephone! Orders are given by telephone! Trenches are connected by telephone! The telephone is as necessary, almost, as guns! Our armies in the field should be equipped with the most efficient communication service! The men in charge of this work should be the best trained body in the world!

That's why we have put our services at the command of the government—to supply men experienced in the technical work of telephone operation.

The employees of our companies are answering the call of Uncle Sam. And, already, two complete companies of well trained telephone men are being prepared for immediate service in the field.

We telephone men have a double duty to perform! First—to supply our country with trained men, and at the same time maintain an efficient service to our subscribers. This latter problem is being made more difficult because of the enormous increase in local telephone traffic. The increase is fully 20 per cent! All telephone materials are scarce. Any sudden freight congestion or an urgent demand of the government might make it necessary for us to draw upon every ounce of our resourcefulness.

In the days before us, it's team work that will win! Every man and woman can do his or her "bit" in many little ways. One of them is avoiding waste in local telephone calls. By practicing this courtesy, you are making it possible for us to push forward to success our work for national defense!

THE KANSAS CITY
HOME TELEPHONE COMPANY

Member of the Kansas and Missouri Group of Independent Telephone Companies for National Defense.

Advertisement Published in Kansas City Newspapers by Kansas City Home Company.

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

694. Outline the operation of the simple recording trunk shown in Fig. 213. Why does the relay *C* lock in the energized position under control of the relay *B*?

695. What is the object in reversing the trunk conductors between the toll terminal and the local terminal?

696. Why does the circuit shown in Fig. 214 require one less wire between the toll switchboard and the local switchboard than the trunk circuit shown in Fig. 213?

697. The wire with which the relay armature contact spring 7 makes contact is carried through the inside jack contact spring on the sleeve side of the trunk to prevent shunting out the tip relay in the local cord pair. Explain how this prevents the shunting out and consequent failure to operate the local cord tip relay.

CHAPTER XXV. The Toll Switchboard (Continued).

698. *Recording trunk circuit for differential line relay type equipment.*—The simple recording trunk circuit shown in Fig. 214 which, with properly-designed relay resistance values, is suitable for use with most of the two-wire multiple local common battery equipments, may not be used in conjunction with the differential line relay local type of switchboard equipment. A somewhat different arrangement of its elements is necessary for use with this kind of local exchange equipment.

A simple recording trunk circuit scheme that may be employed with the differential line relay type of equipment is shown in Fig. 215. The insertion, in the multiple of a disengaged trunk, of the plug by the local operator permits a flow of current over the tip side of the trunk circuit from the positive terminal of the common battery through the windings of the trunk relay, *B*, and the relay on the tip strand of the local cord circuit to the negative terminal of the common battery.

This flow of current causes the armature of the relay, *B*, to be attracted, thereby closing the circuit for a flow of current through the trunk signal lamp, *D*, and the nominally-closed relay contact, 2. The lighting of the lamp, 1, apprises the toll-recording operator of the receipt of the trunked call.

The insertion, by the toll operator, of a plug in the trunk jack, *F*, deflects the ring spring of the jack and completes a circuit at the extra jack spring contact, 4, for the flow of current from the ground or positive terminal of the common battery to the negative terminal of the common battery through the winding of the relay, *C*, and that of the reactance coil, *A*. It is obvious that the sleeve side of the trunk will also be connected with the positive or ground terminal of the common battery through the contact, 5, as long as the toll-recording operator allows the plug to remain in the jack, *F*.

This connection of the sleeve of the trunk with the positive terminal of the common battery through the winding of the reactance coil, *A*, will permit energizing current to flow through the winding of the supervisory relay of the *local* cord circuit and will keep the local calling supervisory lamp dark as long as the toll-recording operator retains her plug in the jack, *F*.

699. *Prevention of display of false signal.*—When the toll-recording operator first inserts the plug into the jack, *F*, the resulting flow of current through the winding of *C* causes it to be energized and the attraction of its armature breaks the circuit through the signal lamp, *D*, darkening it. At the same time the operation of the contact, 3, completes the circuit for the flow of current from the positive or grounded terminal of the common battery, to the negative terminal through the winding of the relay, *C*, and the normally-open relay contact, 1.

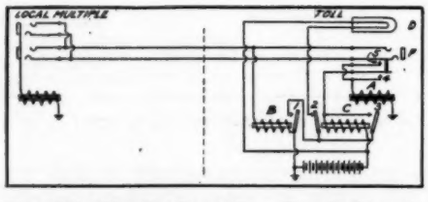


Fig. 214—Simple Recording Trunk Circuit for Two-wire Multiple Local Equipment.

This insures that the relay, *C*, will remain energized as long as the relay, *B*, is energized. The relay, *B*, will remain energized as long as the *local* plug remains in the *local* trunk multiple jack. Therefore a false display of the signal lamp, *D*, when the toll-recording operator removes the plug from the jack, *F*, is impossible. The *local* plug must be removed and a new connection established

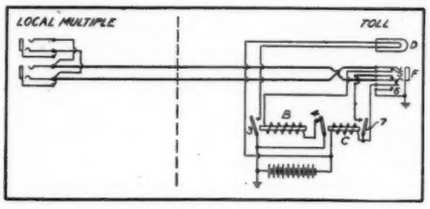


Fig. 215—Simple Recording Trunk Circuit for Differential Line Relay.

at this local terminal before the trunk signal, *D*, can be again displayed.

700. *General operating routine for simple trunk circuits.*—The usual general routine of operation in offices having non-multiple toll switchboards, for which the simple trunk circuit schemes so far suggested are suitable, is as follows: The local operator, upon receiving a call for "long distance," completes the local connection by inserting the calling plug into the multiple jack of a disengaged recording toll trunk circuit. This creates conditions in the circuit that cause a signal associated with the trunk terminal to be displayed on the recording position of the toll switchboard.

When the toll operator inserts a plug into the trunk jack at her position in answer to the signal, the supervisory signal at the local position is operated to apprise the local operator that the called party—in this case the toll-recording operator—has answered. The insertion of the toll-position answering plug also darkens the trunk signal at the toll board and creates circuit conditions that prevent its subsequent display until the connection with the trunk circuit at the local position has been removed and another one made.

When the toll operator has recorded the calling local subscriber's long distance order the connection over the recording trunk and local cord pair is destroyed and the local line circuit is picked up for actual long distance talking by the toll operator on a service toll trunk. This service toll trunk is, preferably, of the plug-ended variety at the local terminal.

When the plug of such a service toll

trunk is inserted into the multiple jack of a local line circuit, the established connection is placed under the complete control of the toll operator. The ideal trunk circuit is so arranged, also, as to permit of ringing the local subscriber directly from the toll switchboard at will. It is also designed so that the most favorable transmission conditions are assured.

Such an ideal toll-service trunk circuit will have associated with it signals at the toll terminal to indicate to the toll operator whether the receiver of the connected local line circuit has been replaced upon the hook awaiting her ring or whether it is still off the hook, indicating that the local subscriber calling for long distance is at his telephone ready to talk.

701. *Modifications from operating routine.*—There are many modifications possible from this rough outline of toll operating routine and there are also many variations possible in the actual arrangement of the elements of the trunk circuits.

Care must be exercised in designing a new trunk circuit that the operation of the equipment is such as to provide the required signaling and transmission conditions. For instance, in all the simple trunk circuits suggested it has been assumed that the cord equipment on the toll switchboard is so arranged that the supply of transmitter operating current is obtained over the toll service trunks from the cord circuit at the toll switchboard. It is obvious that this may not always be found to be true, and when it is not it is necessary to provide some other arrangement of trunk elements than has been shown.

A very useful item of equipment in such cases is the repeating coil which may be used to form an inductive link between the two terminals of the circuit without joining them conductively. This is perfectly feasible while the coil is supplying the transmitter-operating current to only one terminal. Unless great care is exercised, however, in the selection of the repeating coil used, such an arrangement is apt to involve too great transmission losses. With properly-designed repeating coils, however, this arrangement may be used for long distance transmission with very satisfactory results.

702. *The ring-up recording trunk.*—While it is practically standard practice for the local switchboard operator, making connection with the recording trunk, to refrain from ringing, there are several notable exceptions to the general rule. A typical circuit arrangement for a recording trunk circuit to be used with the two-wire multiple common battery local circuit and which requires that the local operator ring, is shown in Fig. 216.

When the operator inserts the calling plug of the cord pair into the multiple jack, forming the local terminal of the recording trunk, she rings just as it is necessary to do in the case of a local to local connection. The alternating ringing current passes out over the trunk circuit and through the main winding of the relay, *B*.

When the armature of relay, *B*, is attracted, as a result of the current flow, it completes a circuit from the office common battery through the normally-open relay contact point and the second winding of the relay, *B*, so that the relay armature is retained in an operated position after the primary energizing flow of alternating ringing current has been interrupted. At the same time the circuit for the flow of energizing current through the signal lamp, *D*, is completed and the lamp becomes bright, apprising the toll-recording operator of the receipt of a call over the associated trunk.

When this operator inserts the plug in the trunk jack, *F*, in answer to the summons indicated by the exposed signal, the sleeve relay, *C*, is operated by a flow of battery current from the sleeve of

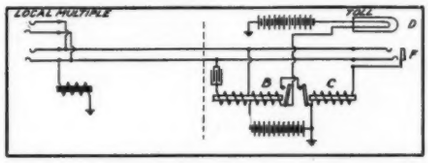


Fig. 216—Simple Ring-Up Recording Trunk for Two-wire Common Battery Multiple.

the cord over the sleeve of the trunk jack. The operation of the armature of the relay, *C*, opens the locking circuit of the relay, *B*, restoring it to normal and thereby darkening the signal lamp, *D*.

The signal lamp, *D*, cannot again be displayed until the relay, *B*, is energized by the passage of *alternating current* through its main winding. The relay, *B*, can only be energized by alternating ringing current, because the condenser in the circuit will prevent the passage of any *direct current* through its winding from the two conductors of the trunk. This feature renders the receipt of a false signal impossible at the toll-recording position when the toll operator withdraws the plug prior to the withdrawal of the local plug.

The only way a signal can be given the toll-recording operator over this kind of trunk circuit is by sending alternating ringing current over the circuit at the time of completing a subsequent local connection.

703. *Disadvantages of the ring-up relay.*—While the trunk circuit shown in Fig. 216 is perfectly operative and practicable, it is subject to certain inherent faults of design that merit the most careful consideration before it is adopted. The relay, *B*, is energized, primarily, by the flow of alternating current through its main or line winding. The magnetic flux in the core resulting from this flow of alternating current is, necessarily, also alternating in character. The current flow, on the other hand, that must be depended upon to lock and retain the armature in the operated position when the energizing current is interrupted, is from the office common battery and is direct.

Should the flow of alternating ringing current be interrupted at the instant when the magnetomotive force, due to its passage through the turns of the main winding of the relay, is *equal* and *opposed* to the magnetomotive force due to the passage of the direct current through the locking winding, there would be no magnetic flux in the core and armature. As a result of one flow of current magnetically neutralizing the effect of the other in this way, the armature of the relay would not be attracted or retained and the signal indicating the receipt of the call would not be displayed at the toll-recording position.

This is an inherent defect in lock-up ring-up relays and it is touched upon in connection with the principles of relay design in "TELEPHONY's Home Study Course for Telephone Men," Section 288, January 15, 1916. This defect in design explains the occasional otherwise unexplained failures of this type of equipment to operate satisfactorily. It is also somewhat of an operating difficulty to require the local operators to ring on the toll-recording trunks while they are instructed to refrain from ringing on all other outgoing trunk circuits, a condition bound to prevail in many exchange districts having more than one office.

(*To be continued.*)

Keystone Telephone Earnings for the Month of May.

The Keystone Telephone Co., of Philadelphia, Pa., has issued its comparative statement of earnings for the combined companies for the month ended May 31, 1917, and the five months ended on that date, as follows:

	For Month Ended. May 31, 1917	Year Previous
Gross earnings	$131,305	$121,702
Operating expenses and taxes	67,181	60,695
Neat earnings	$ 64,124	$ 61,007
Less interest charges	27,792	27,453
Surplus and reserve	$ 36,332	$ 33,554

	For Five Months Ended May 31, 1917	Year Previous
Gross earnings	$645,574	$595,868
Operating expenses and taxes	333,005	297,045
Net earnings	$312,569	$298,823
Less interest charges	138,958	137,264
Dividends	58,106	58,106
Surplus and reserve	$115,505	$103,453

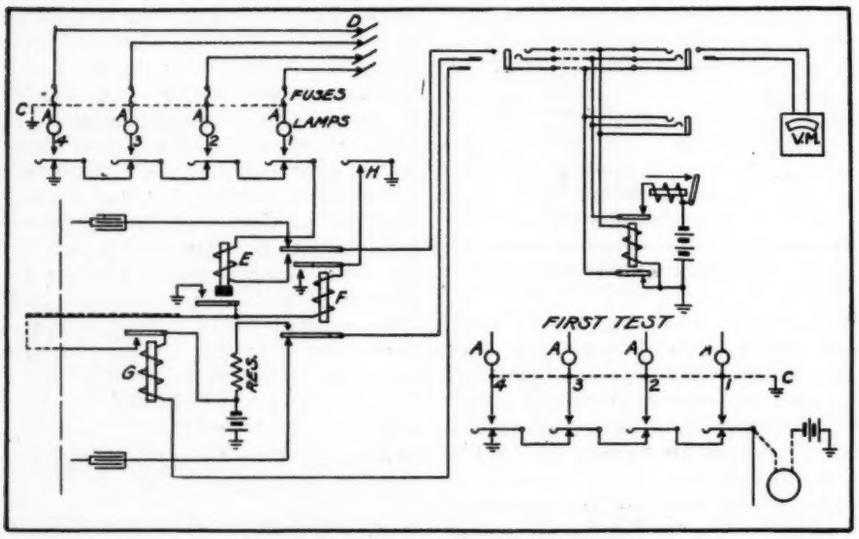
Practical Subjects—Discussions

A Ringing Key Test for Selective Ringing System.

At our exchange we had a four-party, selective ringing system. It was a very busy exchange which threw quite a heavy usage upon the keys. As the exchange had a system of automatic ringing in which the operator was cut off the cord circuit after putting up the calling cord and depended upon the light for supervision, it was necessary to watch the ringing keys closely.

Since the ringing current was interrupted at the point *D* in the accompanying circuit sketch, so as to give a periodic ring, we were unable to use it for a satisfactory test. Hence we decided to make a voltmeter test of the keys, which is more delicate than using the ringing current.

The alternating current, being of a higher voltage, would jump across a bad contact which would be open to the battery current. In this instance, the subscriber's bell would ring but that same subscriber was unable to hear the calling subscriber.



Circuit for the Test of Ringing Key.

In our first voltmeter test we removed the resistance lamps, *A*, which cut the ringing current off the key. A wire connected to a ground which usually was a tip of a calling cord in the adjoining position was connected to the commons, 1, 2, 3 and 4.

A wire from the sleeve of an answering cord was fastened to one terminal of the voltmeter. The wire of other terminal of the voltmeter was soldered to a small suspender clip. This was then snapped to the middle lug of No. 1 set of springs.

When the key was normal, we could test the contacts to the ground at *C;* when depressed, the test would be through the generator contact of the frequency of the button which was set.

This system necessitated that we remove the four lamps, open the keyboard, solder four connections to the commons and change the clip to each set of keys. We also would have to keep the keyboard partially raised so as to facilitate the changing of the clip. Changing the lamps caused us a trip around the board from front to back.

By examining the circuit, it will be seen that, when the calling cord is put up, a contact on the relay, *G*, closes and puts battery on the winding of the relay, *F*. When the operator sets one of the ringing buttons, the contact at *H* is closed, grounding the relay, *F*, and causing it to pull up and lock in that position. The generator circuit through the other contacts is also closed.

When the subscriber answers, the direct current will magnetize relay *E* sufficiently strong to cause it to pull up and close the contact controlled by its armature. The closing of this contact shunts out relay *F*, letting its armature fall back, thus breaking the ringing circuit.

The engineers split the ringing circuits into three divisions, taking position one, next two and the third circuit to position three and then repeating.

By removing the fuses, we would kill every third position. On the switchboard side, we jumpered the four leads together and grounded it. On the main frame we bridged two multiple numbers to an answering jack. A long cord joined the tip and ring of a plug to the voltmeter. Placing the voltmeter in one multiple and the calling cord in the other, we set the ringing button.

Starting at the battery, the circuit is through the resistance on relay *F*, the contact of the lower spring, the ring of the cord and multiple to the voltmeter, back over the tip of the two multiples through the upper contact on relay *F*, relay *E*, through the ringing key to the ground at the fuses.

An open or loose contact will immediately show up on the voltmeter.

By using this test, we eliminate all removal and breakage of resistance lamps, all open keyboards and soldering of jumpers to commons, and a trip from the front to the back of the board. It gave us a normal keyboard during the test. The interference was reduced to a minimum and there was also quite a saving in the time required. Under the previous test, we were able to test three and a part of four keys an hour; with the new test we can easily clean up the full four and get a part of five.

Be sure that the resistance of the voltmeter circuit is high enough so that the current passing through it will not pull up relay *E*. Should this take place, you will be unable to test the keys.

J. W. Hache.

Sunshine and Shadows Along the Telephone Trail.

By Well Clay.

The hands upon our family clock
  Are moved by unseen springs;
The actions of our daily life
  Are swayed by many things.

The minutes of the meeting
  Tell but little of the tale,
For the hows and whys and wherefores
  Are hidden by a veil.

The man that makes a motion
  Or votes in answer to the call
May be influenced most by reasons
  Which he can't explain at all.

It is said that the eyes of tiny insects are so constructed that they see a multitude of things which the human eye is incapable of photographing or of transmitting knowledge to the brain. Likewise I suppose it to be true that the human eye notes a multitude of objects and motions about it which the eye of the insect can neither see nor become interested in.

We live, sphere within sphere, and life within life, each knowing not or caring much about the other. It is only the microscope which gives us passing glimpses of the material world other than our own, and the intellectual or religious focusing power now and then affords us a quickly-fading glance at worlds of which we know little or nothing.

One man looks out of his window of a morning and sees a beautiful day; another sees nothing but the autos which whirl past his door in a cloud of dust. They cannot go so fast but he notes their make, their probable model and their age because he is interested in automobiles.

Another man will never note the pass-

ing stream of vehicles but will study the open book of the faces of pedestrians whom he passes. He will take unconscious note of types, and of individuals of types, and will weave in his mind a little curtain of romance about each. He will fit each with a suit of circumstances from such selection of facts as he may conjecture could and should fit in with their probable environment.

The farmer will pass along the highway and see only the growing crops, while the telephone man steers his precarious way with one eye on the road and the other on the pole line which runs alongside. Whether he is riding along his own pole lines or not, makes no difference to him, any more than it does to the farmer.

Like the farmer, he appraises and compares the lines with his own as a standard, if he is away from home. He is on the lookout for "shorts" in his neighbor's lines, if he chances to ride along them while away from home. In case he finds some trouble on the lines he can hardly resist stopping to fix it. I have known a telephone man to actually stop and take shorts out of a neighboring line which he was passing, just to save that neighbor a trip to do the thing himself. Immediately he did it his mind was at rest and without doubt he forgot the circumstances.

Such a lineman is like the good horseman who cannot bear to see the horse of another go lame for the want of someone to pick a piece of stone from its hoof. If he gets the chance, he will take the foot of the horse in his hand and attend to the matter—and then forget it. I was told once that a person could relieve his mind about an aching tooth by just forgetting about it, but when I wrestled with forgetfulness as a cure, I found out what a remarkable memory I was possessed with—about toothache.

Some cure the evil they see and then forget about the matter, while others seem to be built on the plan of curing the things which are wrong in their systems by forgetting about them.

Once in a while, maybe, you have driven over some parts of your lines and saw, perhaps, where some repairs were urgently needed. You were sure that you were going to come right back there again in the morning and make the needful repairs—not only because they should be made but because a sagging wire or a broken arm or pole was an eyesore to you as well as a menace to the service which it was necessary to give if you kept your quality up to the standard. Then, as you passed along, and other needful repairs in turn took your eye and attention, the first ones gradually faded from your mind. Then you were surprised some day a year later to find, in passing the spot, that they were not only not fixed but were worse than ever.

The need of the repairs had not passed your circle of remembrance since last they had crossed your circle of vision. That is what I mean by curing troubles by forgetting them. It is not to be commended as a good practice, however, because it is apt to lead to poor service and winter trips when the roads are not as pleasant as they are these bright June days.

The lineman who studiously avoids seeing trouble of any nature, whatsoever, until it is thrust upon his consciousness by an order from the boss, is not a good type of lineman. His lines will not have that neat and tidy appearance which is necessary to good looks and the foundation to good service.

We are influenced by a multitude of things, outwardly and inwardly. If the majority of those influences are for good work and a pride in having things neat and tidy, the result will be that you are probably rendering your employer or your community good service. On the other hand, in case the influence is of a tendency to get you into the habit of letting things go and taking life easy, you are probably not of inestimable value to your company as a lineman or to your community as a citizen.

I do not mean that one should be always on the wire edge of excitable energy, but that he should, to be efficient, be a good workman, taking a creditable pride in his work—be ready and willing to take or give an order which will result in a betterment to his plant or his community.

The telephone lineman is just as essential as the banker in his community—the garbage man is as indispensable as either in the general scheme of things. Each person is interested in and drawn to notice more particularly those things which pertain to his trade or profession than are men in other walks of life.

The boy will notice the show window in which the baseballs and bats are displayed, to the utter exclusion of any observation of the window farther down containing the saw and sawbuck and the rake and hoe. I have known grown men to be attracted by a show window containing a tempting array of fishing tackle, or of pipes and tobacco, while they passed, with no outward signs of notice, a fine display of Easter bonnets in an adjoining window. This is but the outward manifestation of the inward inclination to notice only those things which interest us. The degree of interest is generally about equal to the degree of efficiency which we exhibit in our work.

The cat is all attention once it sees a mousehole in some promising corner, and the dog is considerably entertained by a curiosity to find out what is within some hole dug by a denizen of the woods or fields. This is one way to tell whether a telephone man is a good telephone man or not—if he is interested in his work. Like the picture of the man on the front page of the old-fashioned almanac, his works speak for themselves. A good man will keep his lines in shape and the poor one will not be so apt to, except under constant forcing. This test will work on yourself as well as on the manager in the next town.

APHORISM: One generally sees what one looks for.

Cyclone Plays Havoc with Telephone Lines in Kentucky.

On the afternoon of May 27, a cyclone passed through western Kentucky, striking the towns of Fulton, Hickman, Bardwell, Mayfield, Fancy Farm, Dublin, Benton, Viola and the outskirts of Paducah, completely destroying all buildings and towns in its path.

The telephone plants in some of these places were completely wrecked. The Cumberland Telephone & Telegraph Co., in this territory, from estimates, claimed damages to the extent of $10,000. The Paducah Home company was more fortunate, however, for the damage to its lines was not nearly so heavy.

The Bell and Home long distance routes between Paducah and Mayfield were in the path of this cyclone. The Home route was not hurt to any great extent, while the Bell route was torn down for several miles. The construction of both companies appeared to be about equal in both strength and age.

Typical Street Scenes in Bardwell Showing Damage to Pole Leads.

A few days after the storm, District Manager B. Y. Chambers, of the Paducah (Ky.) Home Telephone & Telegraph Co., went to Bardwell and found the plant and central office equipment completely destroyed, as may be seen from the accompanying illustrations.

The operator, Marion Farrow, was injured to the extent of a broken arm, broken jaw bone and a number of bruises. It was some two hours before he was taken out from under the wreck. There were some 26 persons injured, some seriously and some but slightly. Three persons were instantly killed.

The population of Bardwell is 2,500. It is an incorporated town, and Dr. E. T. Gardner is now mayor. Relief was immediately dispatched from many towns, mainly Cairo, Ill., Paducah, Murray and a number of smaller places.

J. Newt Brent is president of the Bardwell Home Telephone Co., and Reed Fisher is the general manager and secretary.

Oshlar Crouch, a young man 20 years old, who has a high school education, was the man of the hour. At Mr. Chambers' suggestion, Mr. Crouch gathered a number of the best parts of the wrecked board, such as drops and jacks, cords and plugs, ringing and listening keys, and old telephone transmitters and receivers, and made a temporary arrangement by building a frame and mounting parts, so as to connect up some half a dozen lines, thus giving some service.

He has been steadily adding to this home-made board and it is said to be very unique and commendable. Since Mr. Chambers' visit to Bardwell, Mr. Crouch has about 50 per cent. of the telephones working. An order has been placed with the Kellogg company for a new two-position 240-line board.

Miss Tommy Stephens is the chief operator, but as luck would have it, no one was in the building but the operator previously mentioned. The Bardwell company is doing everything in its power to restore the service, and things will soon be back to normal.

Havoc Wrought by Cyclone—Front and Rear Views of Bardwell Exchange—District Manager Standing on Uprooted Oak.

How Alexander G. Bell Was Encouraged by Prof. Henry.

In accepting the civic forum medal of honor for distinguished public service, which was presented to him at Carnegie Hall, New York, on March 21, Dr. Alexander Graham Bell told how he was inspired to continue his researches even though he had no electrical knowledge. He spoke, in part, as follows:

"I can remember very well as a young unknown man going to Washington and having the privilege of an interview with the venerable Professor Henry of the Smithsonian Institution. I went there to explain to him the multiple telegraph apparatus on which I had been at work.

I shall never forget the kindliness with which this old man received me, an unknown young man from Boston, and listened patiently to all I had to say, so much so, that I felt confidence in talking to him of things that I had learned to avoid with others. I explained to Professor Henry before the telephone had been developed, my ideas of the transmission of speech by electricity and Professor Henry smiled, but not in a sneering manner, but with sympathetic interest, and encouraged me by saying he thought I had there the germ of a great invention.

Then I began to talk about the difficulty in a way that told Professor Henry that I had not the electrical knowledge to bring it into existence and his laconic reply was, 'Get it.'

Now that is very simple, very easy to say that, but I look back upon that interview with Professor Henry as a critical period of my life in that from discouragement I was encouraged by the greatest scientific man of the day, and I knew my difficulty was that I didn't know anything about electricity.

I now realize that I never would have invented the telephone had I been an electrician. I never would have tried the experiment that resulted in success. Why, who would be so foolish to expect that the vibration occasioned by the voice should occasion an electrical current that a hundred miles away would again occasion sound that amounted to anything! No electrician would have tried.

The advantage I had over others was that sound had been the study of my life, that I knew something of the nature of sound, and of the shapes of the vibrations that passed through the air when we talk, so that I got the idea that if we could get those vibrations in an electrical current, we could transmit speech by electricity. But I didn't have the electrical knowledge and I had to go to work and with the assistance of Mr. Watson, learned about electricity by my own experiment. No electrician would have even tried the ridiculous experiments that we tried, but which luckily for us turned out to be successful."

An Unusual Case of Trouble in Substation Wiring.

Recently a very unusual case of trouble in the wiring of a subscriber's installation was reported by the Lynn Local Telephone Co., of Lynn, Ind. The installation had been made over 12 years ago, and the trouble was just located by the company's troubleman, Oscar M. McCanless.

It seems that a careless employe in the factory where the insulated inside wire was made, in making a splice, simply made hooks on each end of the wires and looped them together, after removing just a little insulation at the loop where the wires crossed. The braid was then run over the splice and completely covered up the defective joint. It is not likely that such a splice would go through the factory very often, but it did in this particular instance, and proved an extremely difficult case of trouble to locate.

Canadian Municipal System Shows Excellent Development.

The Edmonton, Alberta, Canada, telephone system, a municipally-owned system operating automatic equipment, reports an average of one telephone for every six inhabitants.

Biographical and Personal Notes

A. U. Weaver, proprietor of the Santa Anna Telephone Exchange, Santa Anna, Texas, and one of the newly-elected directors of the Texas Independent Telephone Association, is a native Texan.

A. U. Weaver.

His experience in the telephone business has been confined to his home town, where his record is an enviable one, since he has succeeded in building up an Independent telephone property from 50 to more than 400 subscribers, and in furnishing, during his administration of his plant, service of a high quality.

Mr. Weaver is a staunch Independent man, and takes a lively interest in Independent association affairs in his state, making a very welcome addition to the directorate of the Texas state association, to which position he was elected at the Dallas convention in February, 1917.

Harry McAfee, for the past six years associated with the Mountain States Telephone & Telegraph Co. in Montana, has been appointed division superintendent with headquarters in Helena, Mont.

J. B. Fish, for some 20 years associated with the telephone company in Albuquerque, N. M., has purchased a controlling interest in the Estancia Telephone Co., which operates in Estancia and Torrance county, N. M., and will officiate as president and general manager of the company.

Randolph Eide, of Detroit, Mich., supervisor of traffic for the Michigan State Telephone Co., at Detroit, Mich., has been appointed traffic superintendent of the Central Union Telephone Co., at Columbus, Ohio, succeeding James T. Daniels.

D. H. Morris, district manager of the Central Union Telephone Co., at Columbus, Ohio, for the past four years, has been appointed division commercial agent for the Ohio division in charge of advertising and publicity and special service contracts, reporting to W. S. Crater, commercial superintendent.

James T. Daniels, for the past two years traffic superintendent of the Central Union Telephone Co., at Columbus, Ohio, has been promoted to division manager of the Columbus territory, succeeding D. H. Morris.

Earle O. Nelson, local manager of the Consolidated Telephone Co., at Brownsburg, Ind., is a native of Illinois. He was born in the town of Oneida and received his education in the grade and high schools.

Starting in the telephone field at Hughesville, Mo., in 1905, Mr. Nelson was instrumental in the building of several Independent companies now operating in Central Missouri, having charge of the construction work. In 1912 he left the telephone field to engage in the automobile business at Stillman Valley, Ill., only to return in the fall of 1915 as superintendent of the Leaf River-Egan Telephone Co., of Leaf River, Ill.

Earle O. Nelson.

In the spring of 1916, Mr. Nelson became associated with the Consolidated Telephone Co., of Danville, as local manager of the Brownsburg plant. In every company with which Mr. Nelson has been associated—and also with the present one—his slogan is, "Watch us grow."

Mr. Nelson is a member of the Central Indiana Independent Telephone Owners Association, a live and enthusiastic district association which was organized last January by about 50 managers of telephone properties in Central Indiana.

Harold Le Grand Beyer, president of the Interior Telephone Co., Grinnell, Iowa, is a Chicagoan by birth. After graduating from Grinnell College, in 1898, he studied law at Harvard Law School, graduating in 1902.

He practiced law in Chicago for several years and in September, 1905, moved to Grinnell, Iowa, where he has continued with his legal practice ever since.

In January, 1906, Mr. Beyer became director and president of the Interior Telephone Co. and has been associated with the company in that capacity up to the present time. About the same time he became a member of the banking firm of C. W. H. Beyer & Co., of Grinnell. From 1907 to 1912 he was director and treasurer of the Long Distance Copper Telephone Co.

From 1913 to 1915 Mr. Beyer served as president of the Iowa Independent Telephone Association. He was a director of the old Independent Telephone Association of America for several years and is now a director of the United States Independent Telephone Association.

He is a member of the firm known as the Electrical Contract Co., of Grinnell, which is engaged in telephone construction and appraisal work.

Mr. Beyer is a member of the American and Iowa bar associations. He is an Elk and a member of the Grinnell Country Club and the Des Moines Club.

Harold L. Beyer.

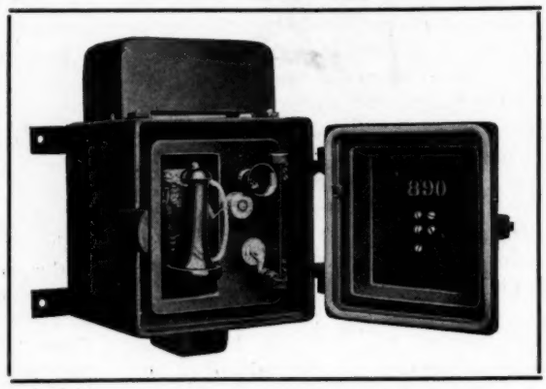
He is one of the solid and stable men who are lending their best efforts to the promotion of the interests of Independent telephony.

From Factory and Salesroom

New Uses for Stromberg-Carlson Mine Telephones.

A short time ago a refrigerating room in a Texas packing house was closed for the night and one of the employes was locked in, with the result that he was frozen to death before the doors were opened next morning.

An enterprising Stromberg-Carlson salesman read of the accident the following day and forthwith interviewed the packing house company upon the advisability of installing telephones in the refrigerating rooms to prevent any serious mishaps in the future. As a result of the conference the owners of the plant authorized the installation of the Stromberg-Carlson Telephone Mfg. Co.'s No. 890 mine telephone in all of the rooms because of its moisture-proof qualities, which are quite essential for service of this nature.



Stromberg-Carlson No. 890 Mine Telephone.

Another interesting installation of these instruments has been made in Philadelphia in a manufacturing plant where the fumes of benzol and other inflammable vapors are apt to be present. The No. 890 telephone is particularly well adapted for service under such conditions because all of the contact points where sparking might occur are enclosed within the sealed apparatus compartment of the set.

Managers of telephone companies should not overlook the possibilities of installations in places where a telephone acts as a "Safety First" appliance of the first order.

New Cameron "Springon" Type G. Cable Rings.

The Cameron Appliance Co., 46 Waters avenue, Everett, Mass., manufacturer of aerial cable rings, ground clamps, and pole changers, has just announced its new Cameron "Springon" ring. For this new type of cable ring, many advantages are claimed.

The essential difference between the new ring and the old corrugated flat wire types, is in the method of attachment to the supporting strand.

On the old-style rings, a special tool or plier is required to crimp the hooks or eyes of the rings to the strand, in order to attach them securely. In this crimping operation, the zinc coating of the hook or hooks of each ring is somewhat cracked. If the crimping is carelessly or thoughtlessly done, it does not firmly secure or place the ring in position. As compared with the new "Springon by Hand" method, which is used in attaching the new Type G. ring, the old operation requires considerably more time, care, and attention.

The new types of cable rings can be instantly attached and removed as many times as necessity demands, without in any way impairing their efficiency or strength.

One of the accompanying illustrations shows the hand grasping the new Springon ring, which is ready to be placed on the strand, while another illustration shows how the ring is clamped to the strand first with one hook, then with the other. The third illustration shows the Cameron "Springon" ring in place.

The new type of rings will be made to fit any two near sizes of strand, as for example, 5-16-inch, (6,000-lb.) ⅜-inch, (10,000-lb.) strand, or ⅜-inch, (10,000-lb.) and 7-16-inch, (16,000-lb.) strands as the case may be. They cannot, however, be used on strands outside of the range for which made, because of the necessity of forming the hooks closely to the strand diameter, so that a proper gripping action, due to the springiness of the body of the ring, will occur.

The new Cameron rings will be made in the usual sizes, of 1¾ inches, 2 inches, 2¼ inches, 2½ inches, 3 inches, and 3½ inches. The stock used is a high-carbon cold-rolled wire, ⅛-inch in thickness, which not only makes the ring very strong, but at the same time furnishes the required resiliency to grip the strands and prevent slipping.

It is stated that the new style of rings can be attached easily and quickly by an inexperienced worker, because, so to speak, they are "fool-proof," and can only be attached in one way, which necessarily is the proper way of putting them on. Further particulars will be furnished by the company upon request.

Davy Jones' Locker Equipped with Stromberg-Carlson Co. P. B. X.

A most interesting P. B. X. installation was recently made on the bottom of the Mediterranean sea when the S. S. Hilonian was torpedoed by an enemy submarine. One of the shipments aboard this general cargo vessel was a Stromberg-Carlson No. A-5550 private branch exchange switchboard consigned to an individual plant in Italy.

Upon hearing of the loss of the shipment E. A. Reinke, sales engineer for the Stromberg-Carlson Telephone Mfg. Co., remarked that old man Neptune cught to send for Annette Kellerman and W. S. Vivian to conduct a mermaid operator's school.

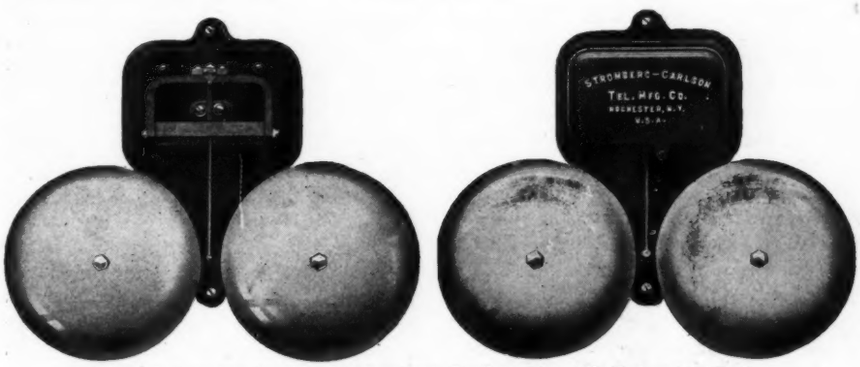
Ready to Attach to Strand.

Placing on Strand.

In Position on Strand.

Stromberg-Carlson Waterproof Extension Bell.

Extension bell service is a profitable source of revenue the possibilities of which are not fully appreciated by many telephone companies. There is scarcely a city or town which lacks a noisy workshop or factory wherein the ordinary telephone ringers are heard but faintly, if at all, at any distance from the instrument. This condition not only means annoyance to subscribers through their inability to "raise" the party called but also financial loss to the telephone company in the case of long distance calls, because of failure to complete the connection.



Open and Closed Views of Stromberg-Carlson No. 962 Extension Bell.

The field for extension bell service is not confined to cities and towns, as the rural districts are full of farmers who would be quick to recognize the benefit of having a loud ringing extension bell on the side of the barn to summon them to their telephone when the folks are away.

The Stromberg-Carlson Telephone Mfg. Co. makes and sells an iron-clad and water-tight loud ringing extension bell which has been used successfully for installations either indoors or in the open, two views of which are shown in the accompanying illustrations. It is assembled upon a cast iron frame which is provided with a removable cover. These parts fit together in such a manner that neither rain nor snow can drive in and affect the operation of the instrument. It is fitted with a pair of eight-inch zinc plated gongs which can be easily heard above the din and clatter of factories and for long distances out-of-doors.

To make doubly sure that moisture will not affect the operation of the bell, the ringer coils are sealed air and water-tight within cylindrical brass protecting cases. These coils are mounted on the frame on either side of and at right angles with the armature which is integral with the clapper rod. The adjustment of the armature is fixed by two eccentric posts situated on each side of the armature.

The apparatus is amply safeguarded against the accumulation of rust and other forms of corrosion by the use of acid-proof paints and heavy zinc plating on all parts, whether exposed to the weather or not.

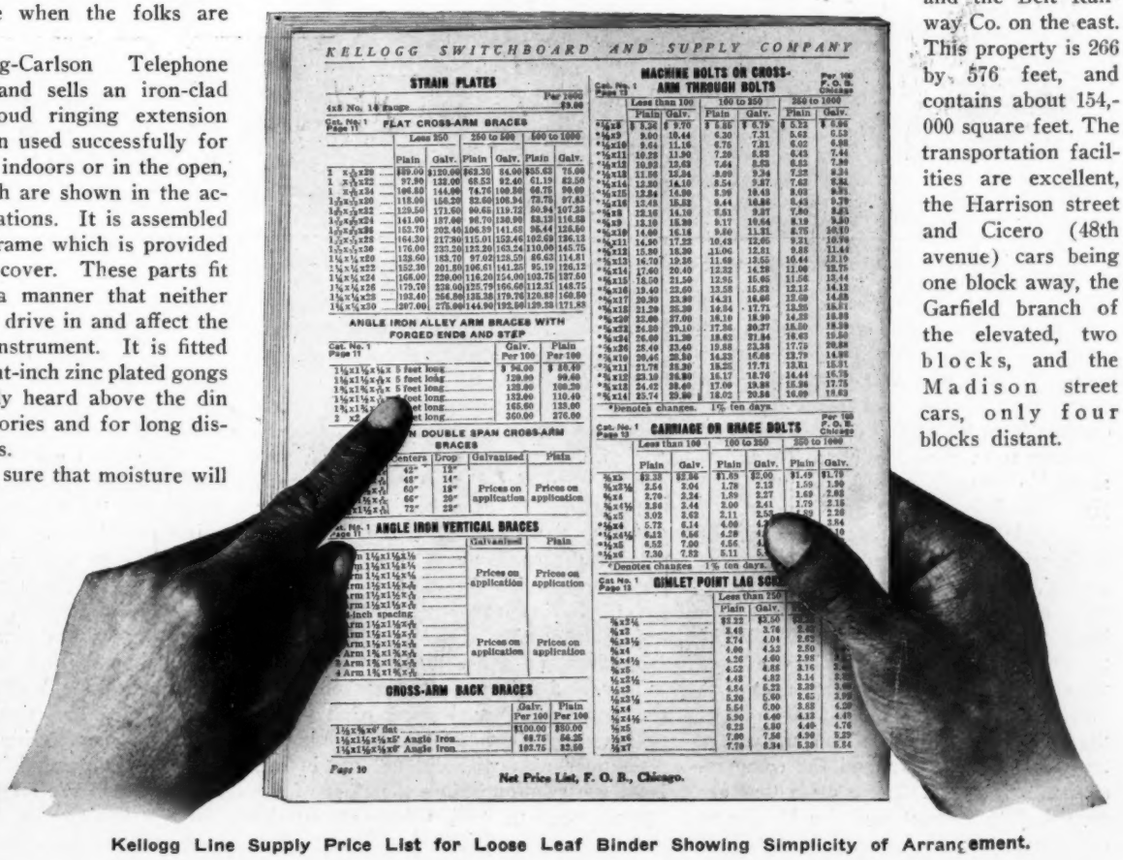
Further particulars regarding this equipment can be obtained from any office of the Stromberg company or from its traveling salesmen.

Loose Leaf Catalog and Supplementary Price List.

Great success is said to have followed the introduction of the illustrated loose-leaf catalog and supplementary net price list plan of the Kellogg Switchboard & Supply Co. The response to the sending of the first and subsequent editions to the trade have been most gratifying, the company reports.

Every telephone man should have one of these books in his desk and insist on having the latest net price list; especially does this apply to line supplies. The accompanying illustration shows the line supply price list open and gives an idea of the simplicity of arrangement and ease of ordering correctly from this book.

The July issue of the Kellogg net price list will be illustrated with new Kellogg line drawings throughout—another innovation of the Kellogg company to make ordering easy and accurate for its customers.


KELLOGG SWITCHBOARD AND SUPPLY COMPANY
STRAIN PLATES
FLAT CROSS-ARM BRACES
MACHINE BOLTS OR CROSS-ARM THROUGH BOLTS
CARRIAGE OR BRACE BOLTS
GIMLET POINT LAG SCREWS
ANGLE IRON ALLEY ARM BRACES WITH FORGED ENDS AND STEP
DOUBLE SPAN CROSS-ARM BRACES
ANGLE IRON VERTICAL BRACES
CROSS-ARM BACK BRACES
Net Price List, F. O. B., Chicago.

Kellogg Line Supply Price List for Loose Leaf Binder Showing Simplicity of Arrangement.

Belden Mfg. Co. Increases Facilities to Care for Growth.

The Belden Mfg. Co., of Chicago, having completely filled its present building, found itself unable to obtain additional manufacturing space necessitated by continued growth. The directors, therefore, decided to purchase sufficient land to take care of the immediate needs, and to eventually accommodate its entire business. It was believed that the future development of the business depended upon the company putting itself in position to make definite plans and work to them.

The company purchased the block of property between West Van Buren and Congress streets, Chicago, with Kilpatrick avenue (47th avenue) on the west, and the Belt Railway Co. on the east. This property is 266 by 576 feet, and contains about 154,000 square feet. The transportation facilities are excellent, the Harrison street and Cicero (48th avenue) cars being one block away, the Garfield branch of the elevated, two blocks, and the Madison street cars, only four blocks distant.

The company's present building plans are modest. It expects to erect a one-story, concrete building, containing 11,000 square feet, and to add additional buildings from time to time as required. Its present manufacturing facilities are all that could be desired, and it expects to continue business in its present location for several years.

Frankel Solderless Connectors for Stranded or Solid Wires.

Among the specialties of the Frankel Connector Co., Hudson and Vestry streets, New York, manufacturer of the well-known Frankel testing clips, are the Frankel solderless connectors. These are designed for splicing stranded or solid wires for heavy capacities without the use of solder. It is stated that these make a perfect mechanical and electrical joint more economically than a soldered splice, time and material considered.

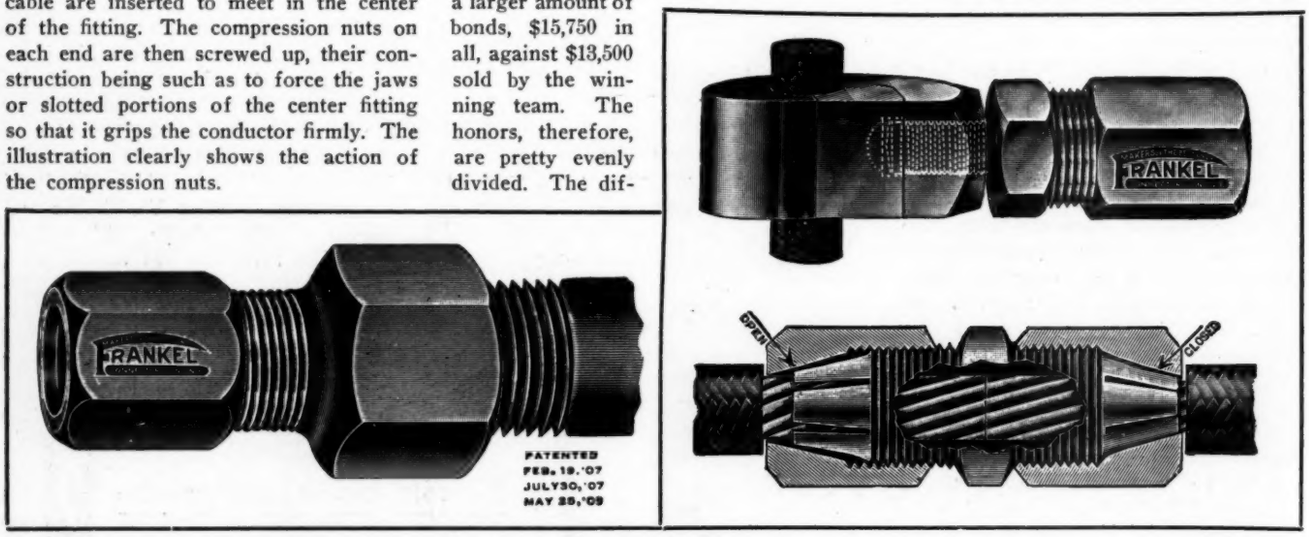
In the Frankel two-way connector, the cross section of which is shown in one of the illustrations, the bared ends of the cable are inserted to meet in the center of the fitting. The compression nuts on each end are then screwed up, their construction being such as to force the jaws or slotted portions of the center fitting so that it grips the conductor firmly. The illustration clearly shows the action of the compression nuts.

The Frankel connectors are finished in any color—nickel, copper-bronze, copper-oxidized or satin-bronze. They are fully described in a catalog issued by the Frankel company, which will be furnished upon request.

Stromberg-Carlson Employes Buy Liberty Bonds.

Stromberg-Carlson employes showed by their response to the nation's call for Liberty Loan bond subscriptions that their patriotism is not confined to flag waving and song singing, but that it is backed substantially by their dollars. At the close of the subscription on June 14, $33,850 in Liberty Loan bonds of various denominations had been signed for by 532 individuals.

The subscription contest between two picked teams of amateur bond salesmen resulted in favor of the "Bankers," captained by George A. Scoville, who registered 232 points. The "Brokers" team, captained by E. W. Anderson, gave them "a run for the money," by scoring 228 points. The latter team, however, sold a larger amount of bonds, $15,750 in all, against $13,500 sold by the winning team. The honors, therefore, are pretty evenly divided. The difference between the total amount of bonds sold and those sold by the teams represents unsolicited subscriptions turned in after the contest closed.



The Frankel Groundcap—Frankel Cabletap—Sectional View of Two-Way Connector.

A modification of the connector is used as a ground cap. This grounding cap connector consists of a fitting that is threaded to receive a standard gas pipe thread and a Frankel solderless sleeve to connect the wire or cable. It is intended for wire from sizes No. 14 to No. 1, and from No. 0 to No. 0000, for use with pipe sizes ⅜-in. to 1-in. in diameter.

In cable taps to connect bleeders of cable, wire, or rod to a main cable, wire or rod, a special form of connector is used, as shown in the illustration. The hook part is attached to the bare wire of the cable, the movable shoe inserted and the connector screwed up until contact is obtained with the wire. The bare end of the bleeder is then inserted into the slotted lower part of the tap and the compression nut tightened. These cable taps are furnished to connect any size bleeder to the feeder or main cable.

Some of the stories told by the solicitors are worth repeating. One is told by one of the men who interviewed a machinist, who, from all appearances, was not rolling in wealth. The solicitor thought, therefore, that the "savings" side of the subject was the one to play up strong. After listening to the benefits of having ready money for about ten minutes, Mr. Machinist dug down into his jeans and pulled out a roll of bills, peeled off five yellow-backed twenties and said, "Yes, I guess what you've said is about right—I'll take a $100 bond."

Another man who did not get in one bond subscription before the close of the contest went up to his foreman on the day before the loan closed, and said, "All the boys are kiddin' the life out of me. Can't you get a bond for me?" He got his bond and our greater respect, because he owned up and came across with his "bit."

The little folks were not forgotten when the cards were signed, for many of them were made out for "Johnnie" and "Mary" by proud fathers, who thereby laid a good foundation for the future happiness of their beloved ones.

Kellogg Company Highly Complimented on Red Cross Records.

The Kellogg Switchboard & Supply Co., of Chicago, has just received a letter from Wm. H. Rankin, general chairman of the American Red Cross, complimenting it upon the list of subscriptions it sent in, and the manner in which the names were arranged. The letter is as follows:

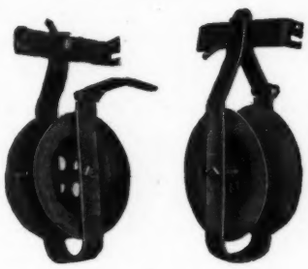
"It gives me a great deal of pleasure to go over your splendid list of subscriptions to the American Red Cross. Of all the lists that I have seen, yours was gotten up in the most complete style, and you cannot imagine how much that helps the men and women who have had the hard work of trying to decipher the penmanship in acknowledging subscriptions for memberships to the Red Cross.

I am going to take the liberty of sending the carbon of the list which you so kindly forwarded to me to H. J. Hill, director of the national membership campaign at Washington, with the suggestion that the manner in which you handled your report is what I would call ideal.

Thank you most sincerely, not only for sending me the list, but for the splendid work which the Kellogg Switchboard & Supply Co. has done in co-operating with the membership campaign in the city of Chicago. We have gone well over 300,000. We started out to get 15[illegible]-000, but it is work like you men and women have done that has made it pos-

Your Cable Workers Need These

SECURITY SPECIALTIES



Security Cable Trolleys

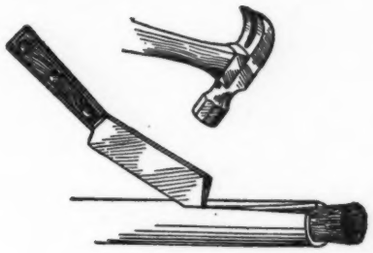
The only trolleys that will take any size cable and release it: Easily attached. Simplest design. Cannot tilt or come loose from strand. No parts to break. Made in two sizes.

$1.90 and $2.40

No. 1 Security Cable Car

Has adjustable seat and pipes forming the frame are continuous. Seat made from hardwood with dovetailed ends. Furnished with or without table.

$8.65 and $12.15



Security Cable Sheath Knife

Made of one solid piece of steel. Blade 4½ in. long and 1½ in. wide. Its strong back will stand much hammering. Heavy pieces of leather are inserted on either side of handle, which is placed at an angle, leaving plenty of finger room between handle and sheath.

50 Cents Each

WRITE FOR SECURITY BULLETIN NO. 6

THE F. BISSELL COMPANY

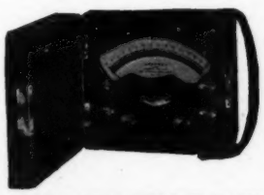
226-228-230 HURON STREET TOLEDO, OHIO

Trouble Detectives!

PIGNOLET Portable Testing Meters will locate any kind of trouble besides measuring volts and amperes; will also determine resistance of coils, lines, ringers, etc.

VOLTMETERS
AMMETERS
VOLT-AMMETERS

Suppose you let us send you a copy of the PIGNOLET Catalogue. It's worth while.

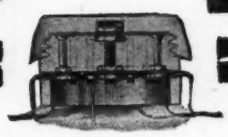


L. M. PIGNOLET

30 Cortlandt Street New York

Medal Panama-Pacific International Exposition

COX



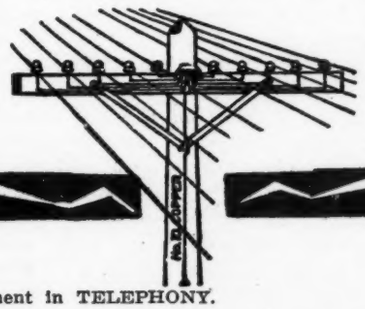
Multiple Lightning Arrester

THE COMMON SENSE ARRESTER—Installed on the poles and distributed along the lines where the lightning strikes.

Do you realize what a relief it is after a lightning storm to find that your lines show **NO FUSES BLOWN, NO CARBON GROUNDS?** Your **SERVICE** has been **PROTECTED** as well as your **EQUIPMENT** and there is no demand for rebate.

One Dozen ($15.00)
will protect 100 telephones.

COX LIGHTNING ARRESTER CO., Eaton, Ohio



sible for Chicago to lead the world as a Red Cross city.

With kind regards and sincere appreciation of your work, I am

Yours very truly,

(Signed) Wm. H. Rankin,
General Chairman."

A Thousand More Automatic Telephones Ordered for Australia.

Orders aggregating 1,000 lines of automatic central office equipment and 1,000 telephones equipped with the dial, have just been placed with the Automatic Electric Co., to be used as additons to the automatic exchanges in Australia. This is the second such order placed since the beginning of 1917, the first one, for 1,800 lines, being received in February.

The progress of the automatic in Australia has been most rapid. Only five years ago there was a single 1,100-line exchange in operation, at Geelong. Today there are nearly a score of exchanges and a total of practically 35,000 lines of automatic equipment in service throughout the commonwealth.

New Wire Connector Having Many Uses.

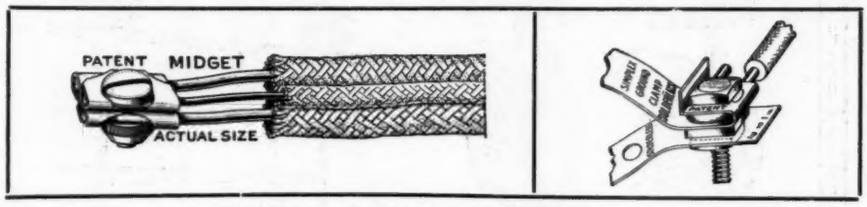
A very light device for connecting smaller-sized wires, which is of interest to telephone men, has been devised by Alexander P. Simpson, 152 E. 53rd street, New York. As shown in the illustration, it consists of two sleeves or loops, into which the wires are inserted and held in place by the tightening of the two screws,

The Four-Wire Connector.

under the heads of which the wires pass. With this device, four wires or less of different sizes may be connected without soldering and still a good electrical connection obtained.

In the Simplex ground clamp, which is of one piece of copper, the tightening up is by means of nuts, as the screw does not turn. The ground wire is threaded through the loop, as shown in the illustration, and then bent around the screw. The band nut is bevel-headed and rides easily.

Another style of connector is known as the Midget clamp, and will connect three wires or less of mixed sizes. The illustration shows how it is used.



The Midget Connector and Simplex Clamp.

Paragraphs.

THE PACKARD MOTOR CAR CO., of Detroit, Mich., has just issued Bulletin No. 36 which answers the question, "Who buys the Packard truck?" Illustrations are presented showing the many and varied lines of industry in which the Packard has proved a favorite.

Thomasville, Ga., Exchange Experiencing Steady Growth.

War seems to have had no ill effect upon the growth of the Thomasville, Ga., exchange of the Consolidated Telephone & Telegraph Co. Manager Caldwell reports that he is constantly adding new subscribers to the list. There are now more than a thousand telephones in operation, which for a city of some 6,700 population is an unusually good showing.

Business in America to Be Undisturbed.

"How can any diseased brain conceive the idea that business can be disturbed in America? * * * Why, my friends, what hurts business? The chief thing that injures business, that destroys business or causes business disturbances is when the demand for the products of America is less than the supply, and you can't sell products of the soil, the mines and the factories at remunerative prices. * * * Whoever heard of business being hurt when the demand was far greater than the possible supply? That is the time when industry is fully employed, when wages are high, when every factory, mine, and farm in the country is taxed to its utmost to produce the stuff that makes business prosperous.

"We have had that condition for the past two years in this country, but that condition is going to be intensified instead of reduced. The one great, serious problem confronting the American people today is to produce enough to meet the demand that is going to be made upon them. We have got to expend in this country in the next twelve months for our own government and allied governments, probably $10,000,000,000, because every year the production in Europe has been growing less, and the demand upon our own market here has been greater. Now you are going to supplement that with the demand of our own government which has not been in the market here for supplies and materials. * * * So far as the great fundamentals of business in this country are concerned, there can be nothing but stimulation, and unless the situation is handled with great wisdom, we will have too much prosperity in America."—William G. McAdoo, Secretary of United States Treasury.

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THE UNIVERSAL PUSH BUTTON

is just the thing for your desk, door bell, buzzer, transmitter cut-out, or any place you have the need of a push button because you don't have to fumble around to find it. The entire top is movable so when it is pressed at any point the contact is made.

¶ The cut is actual size. The button shell is finished in beautiful black enamel, and the top is a black composition, making a neat and attractive article. If you have an electric horn on your car this button will enable you to operate it more easily.

Used by a number of the large Telephone Companies as standard equipment.

The button shell may be finished either in black, enamel or nickel plated.

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